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The Great Lakes Region Plan

JULY 1989

U.S. Department of Transportation
Federal Aviation Administration

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The Great Lakes Region
Aviation Information Division

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FOREWORD

This is the sixth Regional Plan produced by the Great Lakes Region since the mid-1970's. I would like to express my appreciation to all those who worked on producing this comprehensive, yet concise, planning document.

The Regional Plan attempts to tie together the diverse national plans and programs for enhancing the services the FAA provides to aviation users. It also addresses efforts we are undertaking to improve our internal efficiency and effectiveness, and to more fully develop the resources of our employees. This Plan was developed primarily as a management tool; but I feel it will be a useful reference document for all FAA employees, as well as an information document for aviation users and interested parties.

As always, any suggestions you might have that will help us improve the quality of this Plan, as well as our planning process, will be appreciated. For your convenience, a tear-out letter has been provided to facilitate comments.

Timothy P. Forte'
Regional Administrator

PREFACE

This Plan was prepared at the request of the Regional Administrator and division managers in the Great Lakes Region. The Regional Plan is intended to serve primarily as a management tool for the Regional Administrator and division managers; however, it is expected that the Regional Plan will also serve as a useful reference document for all regional managers and employees as well as an information document for aviation users and interested parties.

The objective of the Great Lakes Region is to implement regional plans that support the FAA's mission and the Administrator's objectives. The more effective and more efficient allocation of regional resources to accomplish these objectives will come as a result of adequate planning. This Regional Plan is intended to serve as a guide for the more effective and efficient utilization of resources.

Consultation will be carried out on a continuing basis with aviation users, FAA employees, and other interested parties concerning the Regional Plan. The Regional Plan will be revised annually to reflect new developments and in response to this consultative process. Implementation of all or part of the Regional Plan is subject to the normal review and approval processes.

The contents of this Regional Plan are advisory in nature and do not constitute an official position or commitment by the FAA.

BALANCED BUDGET AND EMERGENCY DEFICIT CONTROL ACT NOTICE

The Balanced Budget and Emergency Deficit Control Act of 1985 (Public Law 99-177, otherwise known as the Gramm/Rudman/Hollings Act) stipulates that Federal budget deficits must be decreased annually and specifies measures that must be taken to achieve this result.

We have no assurance that the FAA budget will not be impacted by the Balanced Budget and Emergency Deficit Control Act. However, the President and Congress have expressed strong support for efforts to modernize the air traffic control system, to increase safety levels, and to meet the increased demands of the future. Based on this support, we have developed the Regional Plan with the assumption that adequate funding will be provided to accomplish the mission of the FAA.

SEND US YOUR IDEAS!

You are invited to contribute to the next version of the Regional Plan by sharing your thoughts, suggestions, and questions on the programs shown in the Regional Plan and ways in which we could make the Plan more relevant to your needs.

Send us a brief description of your ideas using the form below, if you like. Suggestions received before November 30, 1989, will be considered for inclusion in the next edition of the Regional Plan.

Thank you for sharing your ideas with us:

NAME: _____

ORGANIZATION: _____

ADDRESS: _____

CITY/STATE/ZIP: _____ PHONE: _____

Brief Description (use reverse side and attach extra sheets if needed):

Tear out and mail to: Federal Aviation Administration
Policy and Legislative Affairs Branch, AGL-5B
2300 East Devon Avenue
Des Plaines, Illinois 60018

Attention: Carl Ball

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EXECUTIVE SUMMARY

The Great Lakes Region has the responsibility for implementing Regional programs that directly support the FAA's mission and the Administrator's objectives of controlling but not constraining, regulating but not interfering, increasing productivity while reducing costs, and acknowledging the Nation's airspace as belonging to the users. Every manager and employee of this Region is involved on a day-to-day basis with activities that support these objectives, as well as to assure the safe and efficient utilization of the Nation's airspace.

The Regional Plan has been developed to complement National planning efforts and technical studies. This Plan addresses the Great Lakes Region as it exists in 1989, and how it will be in the future. This plan is a summary of division planning efforts within the Region. It is not intended to be an indepth analysis covering every action to be taken in the future. The Plan also emphasizes the role that Regional employees will play in implementing future aviation systems.

The Regional Plan represents the combined input of the Region's staff and division offices working in cooperation with the Planning Staff. The Regional Plan is a common reference point which brings together the various entities within the Region to ensure that our efforts are complementary, nonduplicative, and directed toward a common set of goals. Through consultative planning with aviation users and other interested parties, the Region will insure the widest possible assimilation of input into future Regional Plans.

The chapters and sections of this Plan address the activities this Region proposes to take in response to national plans such as the National Airspace System Plan, Information Resources Management Plan, and the National Plan of Integrated Airport Systems, as well as regional planning efforts addressing Human Relation, external relations, Human Resource Management, and administrative support. Staff work and preliminary planning for other activities not shown in the Regional Plan is an ongoing process. These activities will be shown in the Regional Plan when (and if) a decision is made to implement them.

As you review the Regional Plan, please remember that the contents of this document are advisory in nature and should not be considered as an official position or commitment by the FAA.

CHAPTER 1. INTRODUCTION

a. Purpose

The purpose of the Regional Plan is to assure that national and regional programs are thoroughly coordinated, integrated, and implemented within the Great Lakes Region.

This Plan was developed in support of the following FY-89 regional objective: Publish the FY-90 Regional Plan by September 30, 1989.

b. Objectives

The following objectives were established for the Regional Plan:

1. To assure integrated results of national and regional programs.

2. To manage change to provide continuity and an orderly transition from the present to the future.

3. To identify and manage the resources necessary to carry out this Plan, i.e., human, fiscal, and materiel.

4. To ensure a regional environment that recognizes the importance of individual aspirations as well as organizational objectives.

5. To identify time-phased milestones for the timely implementation of national and regional programs.

6. To facilitate communication and understanding of national and regional programs among national airspace system users and FAA employees at all levels.

7. To maintain and improve service to the public and national airspace system users.

c. Policy

The Regional Plan was developed within the following policy guidelines:

1. Implementation of the Regional Plan will not result in any reduction in primary services to national airspace system users.

2. Implementation of the Regional Plan should not contemplate an increase in Regional employment or operational expenditures, except as adjusted for inflation.

d. Planning Assumptions

The following assumptions were used in developing the Regional Plan:

Adequate funding will be provided to accomplish the mission of the FAA.

The National Airspace System Plan, Information Resources Management Plan, and other approved operating plans will be implemented as indicated in each plan.

e. Scope

Projects were selected from national and regional programs for inclusion in the Regional Plans considering the following criteria:

1. Projects should normally affect more than one division.

2. Projects should be regionwide in application.

3. Projects should not be routine activities or on-demand functions.

4. Projects should involve a significant allocation of Regional resources.

5. High impact projects.

6. Definitive information relating to the project must be available.

It is expected that projects and activities that do not meet these requirements for inclusion in the Regional Plan will be addresses in division and/or field office planning documents.

f. Planning Horizon

The first year of the Regional Plan is FY-90. Data for prior years will be shown when this will aid in understanding ongoing activities.

The planning horizon will extend as far as definitive information is known about a program. Therefore, the planning horizon will vary between chapters of the Plan.

g. Organization of the Regional Plan

The chapters of the Regional Plan are divided as follows:

1. Overview of Great Lakes Region - Chapter 2

2. Human Resource Management - Chapter 3

3. National Airspace System Plan - Chapters 4 through 11. Each chapter covers a major facility type. The relationship of the National Airspace System Plan to the chapters in the REgional Plan is shown in Table 1-1.

4. Information Resources Management - Chapter 12

5. Airport Development - Chapter 13

6. Flight Safety - Chapter 14

7. External Relations - Chapter 15

8. Administrative - Chapter 16

9. Resource Summary - Chapter 17

10. Summary of Accomplishments during 1987 - Chapter 18

11. Appendices - A through E

h. Relation of Regional Plan to National Plans

The Regional Plan has been developed within the framework of national plans such as the National Airspace System Plan, the Information Resources Management Plan, and the National Plan of Integrated Airport Systems.

The national plans must, of necessity, speak to the broad program objectives of the agency. Also, the national plans do not include the many details which are of special interest and value to those offices and facilities, within and outside the FAA, whose primary interests lie within the eight-state Great Lakes Region. This Regional Plan attempts to provide the additional level of detail which is needed by offices and facilities within the Great Lakes Region to manage and implement the national plans.

It is intended that the Regional Plan will be used in conjunction with the appropriate national plans. To do otherwise would require needless duplication of much material from the national plans. We recommend that a copy of the national plans be readily available as you study this Plan.

i. Limitations Upon the Regional Plan

The data contained in the Regional Plan is for planning purposes only and does not constitute a commitment by the Administration. The acceptance of all or any part of this plan is subject to prior review and approval at the FAA, Department of Transportation, Office of Management and Budget, and Congressional levels.

j. Consultative Planning

It is our intention that the Regional Plan serve as a catalyst to insure that all interested and affected parties have an opportunity to furnish input to the planning process in the Great Lakes Region. We are sure that the Plan will generate comments, both pro and con, from the readers. We solicit your comments by November 30, 1989, so we may review and consider them prior to the next issue of the Regional Plan.

Please address your comments to:

FAA, Great Lakes Region
Policy and Legislative Affairs Branch, AGL-5B
ATTN: Carl Ball
2300 East Devon Avenue
Des Plaines, Illinois 60018
or telephone 312-694-7111

Relationship of NAS Projects to Regional Plan Chapters

Project	Related Chapters in Regional Plan 4	5	6	7	8	9	10	11
En route Automation								
Flight Data Entry and Printout Devices	X							
Direct Access Radar Channel (DARC) System	X							
Modern ATC Host Computer	X							
En route Metering II (ERM II)	X							
Conflict Resolution Advisory Function	X							
Conflict Alert IFR/VFR Mode C Intruder	X							
Voice Switching and Control System (VSCS)				X				
Advanced Automation System	X							
Integration of Nonradar Approach Control into ARTCC's, AT/AF	X							
Area Control Facilities (ACF)	X							
Automated En route Air Traffic Control (AERA)	X							
Terminal Automation								
ARTS IIA Enhancements			X					
Provide ARTS II Display			X					
ATCT/TRACON Establishment, Replacement, Modernization			X					
VFR ATCT Closures			X					
Brite Radar Indicator Tower Equipment (BRITE)			X					
TPX 42 Replacement			X					

Relationship of NAS Plan and Chapters of the Regional Plan
Table 1-1

Project	Related Chapters in Regional Plan 4	5	6	7	8	9	10	11
Flight Service and Weather								
Flight Service Automation System (FSAS)			X					
Central Weather Processor (CWP)							X	
Interim Voice Response System (IVRS)			X				X	
High-Altitude En Route Flight Advisory Service (EFAS) Frequencies			X				X	
Hazardous In-Flight Weather Advisory Service (HIWAS)							X	
Automated Weather Observation Systems (AWOS)							X	
Radar Remote Weather Display System (RRWDS)			X				X	
Wind Shear Efforts (LLWAS)							X	
Integrated Communications Switching Systems (ICSS)				X				
Ground-to-Air Systems								
Air/Ground (A/G) Communications Equipment Modernize				X				
Communications Facilities Consolidation				X				
VORTAC					X			X
Instrument Landing System (ILS)					X			
Microwave Landing System (MLS)					X			
Runway Visual Range (RVR)					X			
Visual Navaids					X			
Direction Finder (DF)						X		

Relationship of NAS Plan and Chapters of the Regional Plan
Table 1-1

Project	Related Chapters in Regional Plan 4	5	6	7	8	9	10	11
Mode S/Data Link						X		
Terminal Radar (ASR) Program						X		
Airport Surface Detection Equipment (ASDE 3) Radar						X		
Long-Range Radar Program						X		
Weather Radar Program							X	
Interfacility Communications								
RML Trucking				X				
Data Multiplexing				X				
RML Replacement and Expansion				X				
Television Microwave Link (TML)		X						
Auxiliary Systems								
Remote Maintenance Monitoring System (RMMS)							X	
Computer Based Instruction (CBI)								X
Airport Power Cable Loop Systems								X
Unmanned FAA Airway Facilities Buildings and Plant Equipment								
Acquisition of Flight Service Facilities				X				
National Radio Communications System (NARACS)					X			

Relationship of NAS Plan and Chapters of the Regional Plan
Table 1-1

CHAPTER 2. THE CURRENT AVIATION SYSTEM

a. Introduction

In April 1971, the Federal Aviation Administration established the Great Lakes Region to oversee all aviation activity in Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin. In 1980, North Dakota and South Dakota were added to the Region. The eight states of the Great Lakes Region contain the most heavily traversed commercial airspace and the busiest airport traffic control tower in the world, along with 17 percent of the Nation's pilots and more aircraft than in any other region.

The Great Lakes Region has the following functional responsibilities:

> ...to manage an air navigational and communications system which provides for the control of civil and military air traffic operating within the Region.
>
> ...to implement the Region's Airway Facilities expansion and modernization program and maintain the National Airspace System facilities.
>
> ...to promote safety of flight of civil aircraft in air commerce by assuring the airworthiness of aircraft; the competence of airmen; the adequacy of flight facility performance for compliance with prescribed safety standards.
>
> ...to administer Federal funding programs for development and planning at public use airports in this Region and certify air carrier airport compliance with Federal regulations.
>
> ...to conduct security programs designed to prevent hijacking, sabotage, and other criminal acts against aircraft and airports; assure the highest possible standards of integrity and ethical conduct of FAA employees and representatives; and direct safety programs designed to assure safe air transportation of hazardous materials.

b. Operating Division Responsibilities

The functional responsibilities of the region are performed by the following divisions:

1. Airports Division

The Airports Division has oversight responsibilities for Federal airport planning and development activities. Included in the Division's responsibilities are:

- Grant administration for airport planning and development.
- Conducting airport safety and certifications inspections.
- Performing and reviewing environmental impact analyses.
- Reviewing FAR Part 150 noise compatibility programs.
- Encouraging compatible land uses near airports.
- Reviewing airport siting and other airport improvements for airspace needs. (Lead office for reviewing/coordinating airport airspace studies).
- Assuring the application of Federal standards to the planning, design, construction, and maintenance of airports.
- Recommending appropriate lighting and signage.
- Inspecting pavements.
- Assessing snow removal and crash-fire-rescue equipment needs.
- Assisting states in developing and implementing State Airport System Plans.
- Maintaining the National Plan of Integrated Airport Systems.

The Airports Division has line authority over the Airports District Offices in the region and provides technical assistance to other Federal agencies, local and state governments, the public, and members of the aviation community.

2. Air Traffic Division

The Air Traffic Division provides for the management of civil and military air traffic operating in the navigable airspace within the geographical boundaries of the region. Included in the Division's responsibilities are:

- Directs the operation of regional air traffic control centers, towers, and flight service stations.
- Lead office for establish/discontinue/relocation of air traffic services and facilities within the region.
- Provides for efficient allocation and utilization of the navigable airspace.
- Maintains liaison with military commanders and provides assistance in securing compatibility of civil and military aviation operations.

The Air Traffic Division exercises line authority over Air Route Traffic Control Centers, Airport Traffic Control Towers, and Flight Service Stations within the region.

3. Airway Facilities Division

The Airway Facilities Division is responsible for the operation, maintenance, and modernization of the National Airspace System facilities in this region. Included in the Division's responsibilities are:

- Management of the F&E and Maintenance programs.
- Providing systems engineering support to national and regional programs.
- Installation, construction, and commissioning of new facilities.
- Management of regional frequency engineering and telecommunications programs.
- Administers the non-Federal airway facilities program.

The Airway Facilities Division exercises line authority over the Airway Facilities Sector offices.

4. Flight Standards Division

The Flight Standards Division manages the region's air carrier and general aviation programs, establishes regional requirements for instrument procedures and flight inspection services, and develops the region's requirements for air navigation aids.

Included in the Division's responsibilities are:

- Inspection, certification, surveillance, and evaluation of general aviation and air carrier operations.
- Examination, certification, and surveillance of airmen, examiners, and air agencies.
- Investigation of aircraft accidents, incidents, service difficulties, and violations.
- Focal point for flight inspection and instrument procedures services to be accomplished by the Aviation Standards National Field Office.
- Establish regional requirements for new instrument procedures.
- Evaluate airspace studies to determine their effect on flight operations and instrument flight procedures.
- Develop regional requirements for new terminal air navigation aids (except radar).
- Conduct safety seminars.

The Flight Standards Division has line authority over the Air Carrier District Offices, General Aviation District Offices, and Flight Standards District Offices in the region.

5. Civil Aviation Security Division

The Civil Aviation Security Division and field offices conduct, manage, direct, and assure compliance with agency safety programs for the prevention of criminal acts against air transportation, as prescribed by the Federal Aviation Act.

The division's areas of responsibility include:

- Direct safety programs designed to assure safe air transportation of hazardous materials.

- Prevent hijacking, sabotage, and other criminal acts against U.S. air carrier, certain public, and certain foreign air carrier aircraft.
- Assist law enforcement in the interdiction of air transportation of dangerous drugs and narcotics.
- Enhance air cargo and general aviation security.
- Provide industry with timely information concerning threats against air commerce.
- Provide atmospheric and radiological contamination response.
- Safeguard FAA and national security interests through effective personnel, information, physical, industrial, communications, and automated data processing security.
- Conduct investigations in support of FAA's basic mission.
- Assure the highest possible standards of integrity and ethical conduct of FAA employees and representatives.
- Maintain a cadre of Federal air marshals to provide response capability for the protection of specified flights and other special "law enforcement" needs.

The Civil Aviation Security Division exercises line authority over the Civil Aviation Field Offices.

c. Summary of Current Aviation System

FEDERAL AVIATION ADMINISTRATION KEY OFFICIAL

Regional Administrator Tim Forte' (312) 694-7294	Civil Aviation Security Division Bill McGowen (312) 694-7122	Flight Standards Division Bill Withycombe (312) 694-7252
Deputy Regional Administrator Ed Phillips (312) 694-7294	Logistics Division Jim Washington (312) 694-7287	Aviation Medical Division Paul L. Brattain, M.D. (312) 694-7491
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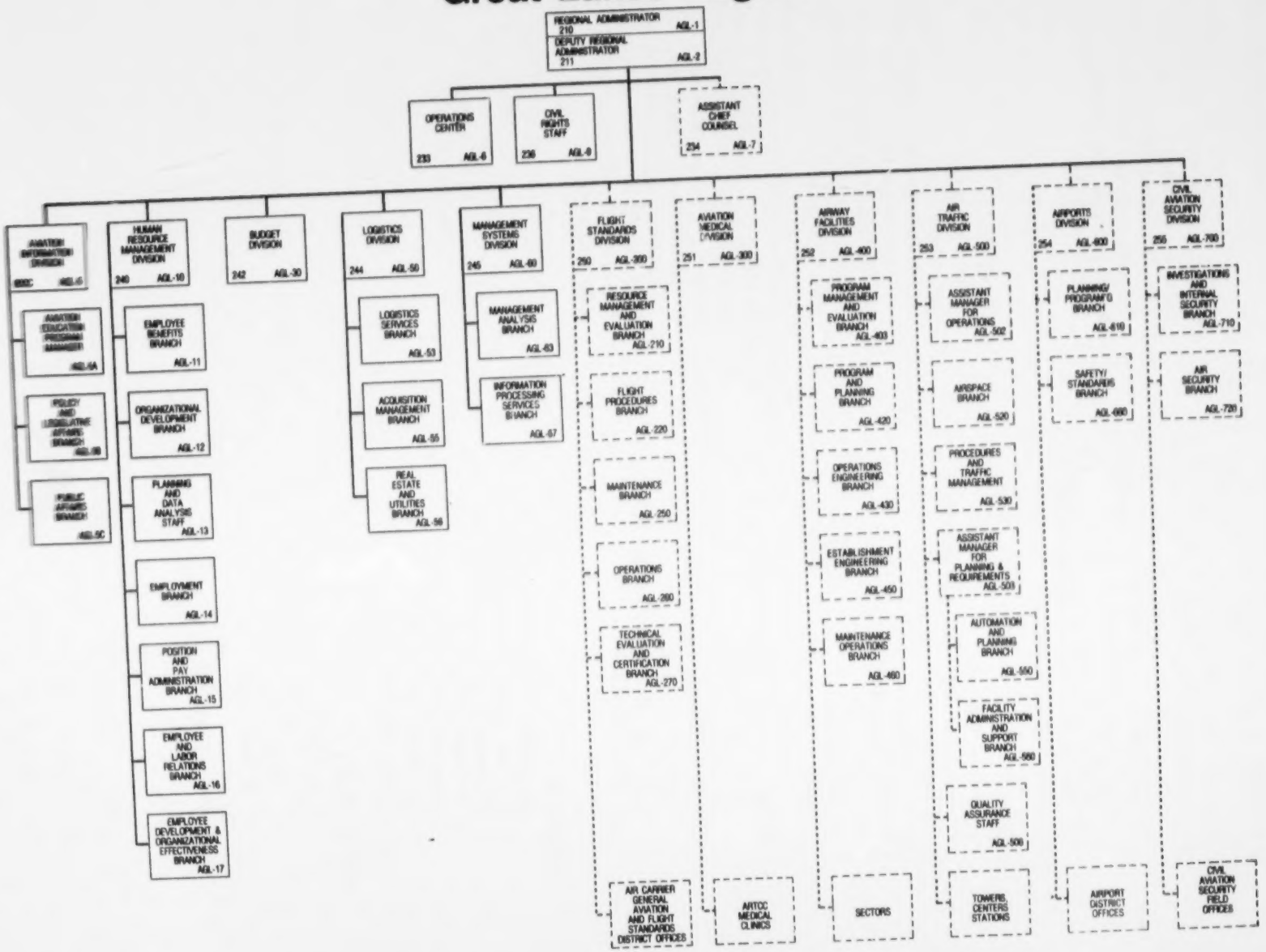
Budget Division Thomas A. Johnson (312) 694-7394	Regional Counsel Eileen Johnson (312) 694-7108	
Management Systems Division Susan Greco (312) 694-7225	Civil Rights Staff Alvin E. Ray (312) 694-7209	

Great Lakes Region



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WISCONSIN

Robert W. Kunkel
Bureau of Aeronautics
Wisconsin Department of Transportation
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Madison, WI 53707
(608) 266-2480

FLIGHT STANDARDS FIELD OFFICES

ILLINOIS
- Air Carrier District Office
  - Chicago
- General Aviation District Offices
  - West Chicago
  - Springfield

INDIANA
- General Aviation District Offices
  - Indianapolis
  - South Bend

MICHIGAN
- Flight Standards District Office
  - Belleville
- General Aviation District Office
  - Grand Rapids

MINNESOTA
- Air Carrier District Office
  - Minneapolis
- General Aviation District Office
  - Minneapolis

NORTH DAKOTA
- Flight Standards District Office
  - Fargo

OHIO
- Flight Standards District Offices
  - Cleveland
  - Ohio Valley
    - Columbus Branch
    - Cincinnati Branch

SOUTH DAKOTA
- Flight Standards District Office
  - Rapid City

WISCONSIN
- Flight Standards District Office
  - Milwaukee

AIRPORT DISTRICT OFFICES

CHICAGO, ILLINOIS
Area of responsibility: Illinois
Indiana

DETROIT, MICHIGAN
Area of responsibility: Michigan
Ohio

MINNEAPOLIS, MINNESOTA *
Area of responsibility: Minnesota
Wisconsin
North Dakota
South Dakota

*** AIRPORT FIELD OFFICE**

Bismarck, North Dakota

CIVIL AVIATION SECURITY FIELD OFFICES

Chicago - Illinois
Indiana
Ohio

Minneapolis - Wisconsin
Minnesota
Michigan
North Dakota
South Dakota

AIRWAY FACILITIES SECTORS

ILLINOIS

Aurora (Air Route Traffic Control Center)
Chicago Airway Facilities
  Chicago Metro SFO II
  Midway Units
* McCook SFO
  DuPage SFO
  O'Hare SFO II
Illinois Airway Facilities Sector
  Springfield SFO II
  Champaign SFO II
  Springfield SFO
  Mt. Vernon SFO

  Moline SFO II
    Peoria SFO
    Rockford SFO
  * Hanna City
    Moline Units
    Kankakee

INDIANA

Indianapolis (Air Route Traffic Control Center)
Indiana Airway Facilities Sector
 Indianapolis SFO II
   Evansville SFO
   Terre Haute SFO
   Lafayette SFO
   Huntingburg
   Indianapolis Units

 South Bend SFO II
   Fort Wayne
   Kalamazoo SFO
 * LaGrange SFO
   South Bend Unit

NORTH AND SOUTH DAKOTA

Dakota Airway Facilities Sector
    Pierre SFO II
      Huron SFO
    * Gettysburg SFO
      Sioux Falls SFO
    * Tyler SFO
      Rapid City SFO
      Pierre Unit
Bismarck SFO II
    Minot SFO
  * Finley SFO
  * Watford City SFO
    Fargo SFO
    Grand Forks SFO
Bismarck Unit

MINNESOTA

Farmington (Air Route Traffic Control Center)
Minneapolis Airway Facilities Sector
  Minneapolis SFO II
  * Nashwauk SFO
    Duluth SFO
    Hibbing SFO
    Rochester SFO
  * Apple Valley SFO
  Minneapolis SFO II
    St. Paul SFO
    Minneapolis Units

WISCONSIN

Wisconsin Airway Facilities Sector
  Green Bay SFO II
* Horicon SFO
  Wausau SFO
  Marquette SFO
  Green Bay Units
  Milwaukee SFO II
    Madison SFO
    Milwaukee Units

OHIO

Oberlin (Air Route Traffic Control Center)
Ohio Airway Facilities Sector
  Cleveland SFO II
  Akron-Canton SFO
  Youngstown SFO
* Brecksville SFO
  Cleveland Units

  Columbus SFO II
  Dayton SFO
* London
  Mansfield SFO

MICHIGAN

Michigan Airway Facilities Sector
  Detroit
    Ypsilanti SFO
    Jackson SFO
    Canton SFO
    Toledo SFO
  * Detroit SFO
    Detroit Units

  Lansing SFO II
    Saginaw SFO
    Grand Rapids SFO
    Traverse City SFO
    Flint SFO
    Muskegon SFO
    Pellston SFO
  * Empire
    Lansing Units

SFO-SEctor Field Office
*ARSR

REGIONAL AVIATION STATISTICS

General Aviation	CY 1988	CY 1987
Airmen (Pilots)	110,804	112,176
Approved Repair Stations	555	555
Mechanic Schools	32	31
Aircraft	49,782	48,764
Mechanics	44,207	35,075
Pilot Schools	119	111
Examiners	610	558
Aerial Applicator Operators	730	532
Industrial Operators	195	194

Air Carrier	CY 1988	CY 1987
Domestic/Flag (Part 121)	8	8
Supplementals (Part 121)	9	11
Commuter Air Taxi (Part 135)	13	13
On-Demand Air Taxi (Part 135)	446	390
Part 125	3	4
Check Airmen	1,116	575 *
Aircraft (Part 121/125)	691	630
Aircraft (Part 135)	2,484	2,431
Airports (Part 139)	119	127

* Increase as a result of redefinition of "Check Airmen"

REGIONAL OPERATIONS ACTIVITY

Facility Type	Number of Facilities	FY-1988 Activity	FY-1987 Activity	Change
Air Route Traffic Control Centers	4	8,320,209	7,951,095	5%
Airport Traffic Control Towers	69	9,851,087*	9,657,941	2%
Flight Service Stations	31	7,407,474	7,866,497	-6%

* ATCT totals are airport operations

OPERATIONAL FACILITIES AND AIR NAVIGATIONAL AIDS
(FAA Plus Non-Fed facilities)

	February 28, 1989	
Approach Light System (ALSF)	12	
Short Approach Light System (SALS)	0	
Medium Intensity Approach Lighting System with Runway Alignment Indicator Lights (MALSR)	118	
Medium Intensity System (MALS)	9	
Runway End Identifier Lights (REIL)	109	
Visual Approach Slope Indicator (VASI)	247	
Full Instrument Landing System (ILS)	165	(including 4 non-Fed)
Localizer/Marker only	23	(including 11 non-Fed)
Remote Communication Air/Ground Facility (RCAG)	102	
Very High Frequency Omni Range (VOR)	189	(including 31 non-Fed)
Tactical Air Navigational Aid (TACAN)	100	
Distance Measuring Equipment only	3	
Automated Radar Terminal System (ARTS III/IIIA)	9	
Automated Radar Terminal System (ARTS II)	16	
Air Route Surveillance Radar (ARSR)	15	
Airport Surveillance Radar (ASR)	35	
Airport Surface Detection Radar (ASDE)	2	
Flight Data Entry and Printout (FDEP)	44	
Runway Visual Range (RVR)	76	(including 3 non-Fed)
Direction Finder (DF)	33	
Distance Measuring Equipment (collocated with VOR)	71	(including 22 non-Fed)

FULL-TIME PERMANENT STAFFING*

Operations, Direct	FY-1984 on board as of 9/30/84	FY-1985 on board as of 9/30/85	FY-1986 on board as of 9/30/86	FY-1987 on board as of 9/30/87	FY-1988 on board as of 9/30/88
Headquarters	353	359	355	369	393
Field					
Air Route Traffic Control Centers	1,502	1,804	1,843	1,961	1,986
Airport Traffic Control Towers	1,627	1,650	1,631	1,649	1,766
Flight Service Stations	650	680	716	678	638
Airway Facilities	1,378	1,341	1,233	1,267	1,252
Flight Standards	262	255	287	299	319
Civil Aviation Security	17	20	33	28	40
Airports	56	54	53	57	57
Air Route Traffic Control Center Medical Clinics	5	5	6	6	6
TOTAL REGIONAL STAFFING	5,850	6,168	6,157	6,314	6,457

REGIONAL FISCAL DATA

Fiscal Year	Operations*	AIP/ADAP Grants	Facility and Equipment (excluding Washington Equipment and Support)
FY-81	$279,997,900	$ 59,009,228	$10,951,778
FY-82	$232,839,300	$ 60,744,457	$ 7,451,700
FY-83	$276,371,600	$135,035,929	$ 8,354,500
FY-84	$287,603,400	$129,326,961	$11,703,400
FY-85	$306,084,600	$144,494,258	$18,723,100
FY-86	$314,973,000	$142,552,947	$15,127,500
FY-87	$336,906,400	$150,012,690	$16,289,740
FY-88	$358,190,000	$115,279,800	$19,115,000

* Excludes Ops. Reimbursable

CHAPTER 3. HUMAN RESOURCE MANAGEMENT

a. Human Resource Management's Role in the Great Lakes Region

Human resource management's (HRM) role in the Great Lakes Region is to link effective people management and our technical resource planning together to produce more effective services.

b. Human Resource Management Division Initiatives and Priorities

Human Resource Management actively seeks to provide leadership, human resource planning and personnel services to the operating and staff functions of our region.

The Great Lakes Region's management team and the Human Resource Management Division are committed to participative management, improving job satisfaction, and effectively planning and merging concerns for people with technical changes.

Our top priorities are:

1. Expand the regions efforts in EEO recruiting.

2. Aggressively promote and provide leadership in human resource management.

   This includes a strong program for performance management as the basis for setting meaningful work performance standards, evaluating employees, establishing training needs and determining awards.

   Through a program of organizational effectiveness, and by working through the results learned from the Survey Feedback Action Program, we will assist managers in improving their management style. These efforts are intended to improve job satisfaction and increase employee participation in managing and in promoting meaningful change in our organizational culture.

   By emphasizing a problem solving approach to grievances, complaints, and employee conduct issues, we will steer our organizational culture toward a non-confrontational way of conducting business in these highly sensitive areas.

3. Maintain and improve the effectiveness of the HRM Division.

   In our FY-91 budget request, we cited the need for 9 new positions.

   We have initiated automation plans to re-allocate resources and to speed service. In the fall of 1989 we plan to upgrade our system for electronically transferring and processing personnel actions requests. The upgrade should give us a foundation for expanding the system to more users.

We have begun using a tracking system for new ATCS hires, and we are working on our system to speed job vacancies announcements.

We have implemented an automated system for testing air traffic control job applicants. This allows us to score the tests and return the results to the applicants at their test sites. This is part of an overall effort to shorten processing cycles and the time it takes to hire new air traffic controllers. We will place additional test-scoring equipment in four sites around the region to make it readily available for region-wide testing efforts.

4. Improve the delivery of HRM services and HRM information to employees.

Through FY-90, we will conduct a service delivery assessment of every facility in the region. This will be accomplished using mailed evaluation questionnaires, optical scan review of the individual responses and consolidated reports to our division and facility management teams.

c. Human Resource Plans

1. Air Traffic Division

(a) Relocating the Chicago O'Hare Tower and TRACON

Currently, the FAA is in the process of selecting sites to relocate the Chicago O'Hare Control Tower and TRACON. The Chicago O'Hare facility is rapidly outgrowing it's physical space and has to move.

As part of the overall expansion effort, FAA plans to build a new tower by mid-1992 and a new TRACON facility by mid-1993. The new TRACON site could be on or off airport grounds and could be anywhere within the vicinity of the TRACON's airspace boundaries.

The FAA will survey employees currently assigned to the Chicago/O'Hare facility. With the input from the employees, operational requirements, and other evaluating factors, a site should be identified and selected for the new Chicago TRACON by June, 1990.

(b) Automated Flight Service Station

The closing and consolidation of the flight service stations has, in some instances, been delayed due to budget constraints. The Air Traffic Division, in concert with the field facilities, has developed transition plans for consolidation of all flight service stations within the region. Representatives from the Air Traffic Division and Human Resources Management Division have traveled to several flight service stations within the Great Lakes Region to brief the employees on their options (retirement, discontinued service, offer of employment) and permanent change of station benefits, including the new relocation service now available to all FAA employees.

2. Airway Facilities Division

Methods for planning, operating and maintaining NAS facilities is a rapidly changing business driven by technology and ever-increasing demands to improve funding efficiency.

(a) Regional Office People Priorities

The regional Airway Facilities Division has become a greater participant in national initiatives through taking on specific tasks assigned under the lead region concept. The region's Airway Facilities employees have taken on new responsibilities. We expect this trend to continue through the coming years.

The regional Airway Facilities Division has expanded its role in systems engineering, planning, acquisition and installation support for NAS modernization. The 1984 regional office reorganization accommodates our need to meet changes and, coupled with our sector reorganizations of 1978 and 1983, comprises the backbone of our people planning work.

(b) Implementation

Implementation, of the NAS plan in particular, is primarily accomplished by Facilities and Equipment (F&E) functions of the Program and Planning and Establishment Engineering Branches. The greatest challenge here is the determining and obtaining of resources to accomplish the NAS plan. An F&E manpower study initiated in 1984 is determining what that personnel requirement is and will be. With the constraint of little, if any, staffing increases, other methods such as contracting are being explored. Existing and newly recruited people will have to learn new skills in managing engineers and contractors to accomplish what they previously did themselves. Many programs will be accomplished by national contracts, with some regional office assistance and surveillance. Also, a

National Systems Engineering and Integration contractor has been hired to help plan and schedule on both national and regional levels.

We plan to accomplish the Regional Maintenance Program transition using effective position management which requires that we recruit and/or reassign existing employees to where the strongest operational requirement exists and that a full workload is assigned for each employee. These objectives should be accomplished with few exceptions during FY-89. Consideration will be given to slippages in equipment conversions or commissionings, employee preferences, future position requirements (to avoid double moves) and other highly unusual conditions that will cause limited delays of the transition into FY 1989 and beyond.

As essential vacancies occur throughout the region, existing agency procedures will continue to be used to recruit from outside the FAA and place qualified employees from AF field organizations staffed above the desired level to other AF organizations having vacancies.

To meet position management objectives and to minimize the impact to personnel, all of the following staffing information will be considered as the necessary staffing adjustments are effected:

1. Budgetary restrictions.

2. Facility Master File (FMF) generated workloads.

3. Tentative staffing allowances and estimates for FY-89 and FY-90.

4. Position Organization Charts (POC).

5. Projected attrition rates.

6. System changes, e.g., solid state, RMM.

7. Future staffing requirements.

3. Flight Standards Division

The Aviation Safety Analysis System (ASAS) is the automated program which allows Flight Standards to access and update various subsystems. The current ASAS subsystems are:

1. Work Program Management Subsystem (WPMS)
2. National Program Guidelines Subsystem (NPGS)
3. Enforcement Information Subsystem (EIS)
4. Service Difficulty Reporting Subsystem (SDRS)
5. Comprehensive Airman Information Subsystem (CAIS)
6. Regulatory Background Reference Subsystem (RBRS)

7. Automated Federal Air Regulations Subsystem (AFARS)
8. Vital Information Subsystem (VIS)
9. Operations Specification Subsystem (OPSS)
10. Master Minimum Equipment Lists (MMEL)
11. Simulator Inventory and Evaluation Schedule Subsystem (SEISS)
12. Job Aids Disk (IAD)

The following subsystems are currently under development:

1. Uniform Task Reporting (UTR)
2. Accident Prevention Subsystem (APS)
3. Airworthiness Directive Subsystem (AWIS)
4. Automated Archives for Regulatory Subsystem (AARS)
5. Rules Genesis Subsystem (RGS)
6. Policy Memorandum Subsystem (PMS)
7. Automated Exemptions Subsystem (AES)
8. National Aircraft Registry Information Subsystem (NARIS)
9. NTSB Recommendations Subsystem
10. FAA Recommendations Subsystem
11. NTSB/FAA Common Data Bases Subsystem
12. Near Mid-Air Collision Subsystem (NMACS)
13. Safety Analysis Subsystem (SAS)

Currently underway is a process to enhance and convert to second generation hardware/software the following subsystems: WPMS, NPGS, VIS, and OPSS into a new subsystem called Program Tracking and Reporting Subsystem (PTRS).

Development of Aviation Safety Analysis System (ASAS) software programs has proceeded on schedule; however, needed hardware and training to implement these new programs has seriously hampered use of the subsystems.

4. Airports Division

The Airports Division continues to update and improve its automation capabilities both in airport safety and grant management aspects. The Division Office is entering airport safety data information into the AIRMIS data base. AIRMIS, originally developed by Northwest Mountain Region, provides an ability to list and sort by airport and type of airports, safety inspection results, compliance findings, etc. The AIRMIS Program is run on the Region's MV-15000. The Division is also participating in the national task force to develop a new system called CCMIS, which is a PC-based airport Certification and Compliance Management Information System. This program should become operational in late 1989. The Division currently provides input to the Enforcement Information System (EIS) in follow-up to the investigation of FAR Part 139 violations.

A Staffing Standards Study for Airports was completed in 1987. Based on an exhaustive national study of functional responsibilities and the work effort required to adequately address these responsibilities, the study provided the first accurate picture in over 15 years of the human

resources necessary to manage the airports program. Utilization of the Staffing Standards indicated a need for 85 positions in the division for FY-1990. This data has not yet been received for FY-1991, however the current authorized staffing is 63 for FY-89 and 67 for FY-90.

The FY-1990 and FY-1991 regional budget submissions contained justification for the 22 position increase. While the obtaining of these additional positions is doubtful, Airports Division has recognized the immediate need for an increased emphasis on enhancing aviation safety, increasing airports capacity, and dealing effectively with noise and environmental issues on or about airports. To that end, the division has completed an initiative to improve its overall management program with specific changes related to the airport's mission, functions, and organization. The end product was a reorganization, primarily focused on the Division Office, which took effect October 1, 1988. The four (4) additional positions received for FY-1990 are to accommodate increased activities in capacity/planning, and safety/certification programs.

d. Special Emphasis Program

1. Human Resources (HR)/Organizational Development (OD)

Key Accomplishments January 1 - December 31, 1988):

a. Conducted Employee Attitude Survey follow-up visits to field facilities to assess progress made in the 1986 action plan.

b. Initiated the planning and developed processes to be used in the Great Lakes Survey Feedback Action Program.

c. Conducted Survey Feedback Action Program briefings and training for managers, supervisors, union reps, employees, and site representatives.

d. Trained 24 SFA Facilitators to assist managers and supervisors in conducting the SFA feedback sessions and action planning.

e. Completed consultation to three change management projects involving organizational changes.

f. Completed consulting efforts and specific OD activities in target organizational units, i.e., ARTCCs, AFSS, Staff Divisions, Flight Standards, and Airports Divisions, etc.

Schedule of Events:

Provide consulting services and related activities to support improved organizational/operations effectiveness.

a. Conduct a minimum of six OD interventions as directed by the Regional Administrator and/or division managers to solve specific problems.

b. Utilize field HR/OD facilitator resource people on projects and provide OJT development to enhance OD skill and knowledge. Conduct minimum of three projects.

c. Institute recommended changes/modifications to content/format of the Communications Effectiveness Workshop. Conduct up to three workshops.

d. Coordinate and/or provide assistance to managers/supervisors in conducting SFA feedback sessions and action planning.

e. Continue to provide training to support a participative management culture.

f. Continue to provide facilitation for teambuilding and intergroup development in the region.

g. Assist in planning and conducting the SFA follow-up evaluation.

h. Provide assistance to any Critical Concern Groups identified by the SFA in our region.

2. Affirmative Action Plan

Description and Purpose

Affirmative action and special emphasis programs have been implemented within the Great Lakes Region to increase the representation of minorities and women at all levels. Such programs include the Equal Employment Opportunity Commission's (EEOC) Multi-Year Affirmative Employment Plan (AEP); Federal Equal Opportunity Recruitment Plan (FEORP); Co-Op Education and Upward Mobility Program; Federal Women's Program (FWP); Field Facility Affirmative Action Plan; Hispanic Employment Program (HEP); Supervisory/Managerial Selection Coordination; and the Secretary of Transportation's initiatives to recruit and develop women and minorities.

Accomplishments (January 1 - December 31, 1988)

(a) The Civil Rights Staff submitted the region's FY-88 AEP accomplishment report to the agency's Office of Civil Rights and the Regional EEOC office in July 1988. The new multi-year AEP was submitted to the Regional EEOC office in September 1988 and was returned for further revisions. It was updated and resubmitted to the Regional EEOC July 1989.

(b) Black History Month was observed in the regional office in February 1988, Women's History Month in March 1988, Asian Pacific American Heritage Week in May 1988, Women's Equality Day August 1988, and National Hispanic Heritage Month in September/October 1988.

Schedule of Events

(a) An accomplishment report and update will be completed at the end of each fiscal year for the Multi-Year Affirmative Action Plan.

(b) Special events are scheduled annually to call attention to contributions made by minorities and women:

Black History Month = Month of February
National Women's History Month = Month of March

Asian Pacific American Heritage Week = First or second week in May
Women's Equality Day = August 26
Hispanic Heritage Week = Last two weeks in September (to include the 16th of September) and first two weeks in October.

Coordination

The lead office for the affirmative employment programs at the Human Resource Management Division and the Civil Rights Staff:

Program	Organization	Telephone
FEORP	Employment Branch	(312) 694-7731
Predevelopment	Employment Branch	(312) 694-7731
Co-op	Employment Branch	(312) 694-7731
Upward Mobility	Employment Branch	(312) 694-7731
Multi-Year AEP	Civil Rights Staff	(312) 694-7209
FWP	Civil Rights Staff	(312) 694-7209
Field AEP	Civil Rights Staff	(312) 694-7209
Sup/Mngr Selections	Civil Rights Staff	(312) 694-7209
HEP	Civil Rights Staff	(312) 694-7209

3. Employee Assistance Program (EAP)

The Great Lakes Region completed a four year EAP contract with Hazelden Employee Assistance Services, Inc. on September 30, 1988. A new and expanded three year EAP contract was awarded to Hazelden EAS, Inc. effective October 1, 1988. The newly awarded contract covers 6700 Great Lakes Region employees and their families, offers 70 supervisory training sessions, 90 employee orientation sessions, and an expanded case management system for substance abusing employees.

The utilization rate for FY-88 remained at five percent. The Helpline telephone utilization rate increased from 54 percent in FY-87 to 59 percent in FY-88.

The operating divisions from which the EAP clients came is as follows:

Administrative Services	3%
Air Traffic	60%
Airports	1%
Airway Facilities	8%
Civil Aviation Security	0%
Flight Standards	4%

Supervisory referral rates increased from 10 percent in FY-87 to 11 percent in FY-88. We continue to see increases in this area due to the educational information offered during annual supervisory training sessions. In FY-88, training was specifically geared to chemical dependency in the workplace.

Management consultations with the EAP in order to make a referral remained at 7 percent for FY-88. Statistics representing drug and alcohol as the assessed primary problem have decreased from 16 percent in FY-87 to 14 percent in FY-88. This statistic represents closed cases and does not include cases worked on in FY-88 which are still under the one year rehabilitation agreement and follow-up period.

The leading assessed primary problem remained marital/personal relationships, however, it decreased from 28 percent in FY-87 to 21 percent in FY-88. A major increase was seen in the job stress statistic which almost doubled from 7 percent in FY-87 to 13 percent in FY-88. Due to this increase, the supervisory training offered in FY-89 is specifically geared to stress management, incorporating additional information on chemical health.

One month follow-ups showed an increase form 65 to 67 percent of the clients felt that after utilizing the EAP there had been a change for the better. Confidentiality satisfaction increased from 89 percent in FY-87 to 92 percent in FY-88.

Plans for training during FY-89 include an affiliate conference during the second quarter at which time counselors were briefed by FAA and Hazelden personnel on trauma intervention in the workplace. In addition, twelve FAA personnel were trained during the second quarter at Hazelden, in order to facilitate wellness workshops on-site at their facilities.

Orientation sessions for employees will be conducted for the first time in five years, at forty three sites across the region. An employee orientation video tape written together by the FAA and Hazelden personnel will be shown at each orientation session and will be available in open caption for the region's hearing impaired employees.

DRUG TESTING

All positions that have been determined to be safety/security related (Category I) are covered by the random drug testing program. DOT has contracted for Upjohn to make all random drug test collections and for CompuChem Laboratories to test all specimens.

The first time employees test positive for illegal drug use, they are relieved of safety/security duties and offered rehabilitation and post treatment monitoring through the Employee Assistance Program (EAP). The focus of this phase of the program is on the employee's rehabilitation and return to safety related duties in as expeditious a manner as is possible.

CHAPTER 4. EN ROUTE (ATC) SYSTEMS

The four en route centers in the Great Lakes Region provide radar service to IFR and VFR aircraft in 14 states. Presently, the control of air traffic in en route airspace necessitates the use of 152 total control positions or sectors at these facilities. Economics, growth and the resulting increase in air traffic are projected to slowly increase this number to 167 in 1991.

Beginning in 1985 with the center building expansion, (section b), the National Airspace System will progress systematically toward integrating select TRACON/TRACAB facilities together with en route centers into Area Control Facilities (ACF's). With the completion of this immense project with its interrelated and important subsystems, the Great Lakes Region will provide a more safe, orderly and expeditious service to the flying public.

The following sections are contained in this chapter:

a. En route Growth and Development Efforts

b. Center Building Expansion

c. Area Control Facilities (ACF)

d. Flight Data Entry and Printout Devices

e. Traffic Management System

f. En route Automation Enhancements

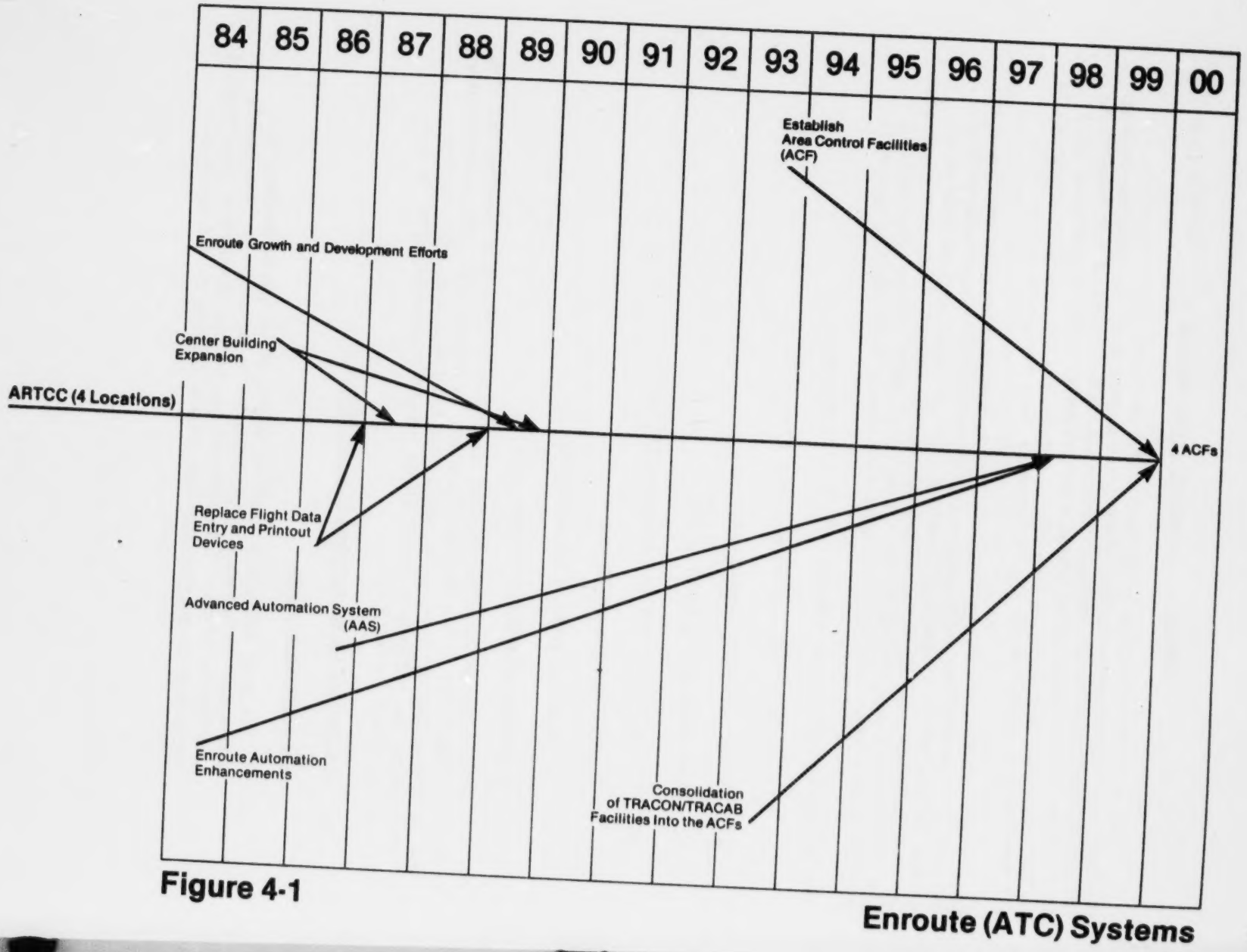
g. Advanced Automation System (AAS)

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 4-1. The nomenclature used in the evolution diagram is explained in Appendix E. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. En Route Growth and Development Efforts

Description/Purpose

By the year 2000, air traffic demand at en route centers is projected to increase regionwide by 10 percent over the levels reached in FY-88. This section identifies the sector requirements necessary to accommodate the future demands on air traffic.


84
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Establish
Area Control Facilities
(ACF)
Enroute Growth and Development Efforts
Center Building
Expansion
ARTCC (4 Locations)
4 ACFs
Replace Flight Data
Entry and Printout
Devices
Advanced Automation System
(AAS)
Enroute Automation
Enhancements
Consolidation
of TRACON/TRACAB
Facilities Into the ACFs
Enroute (ATC) Systems

Figure 4-1

Accomplishments (January 1, 1988-December 31, 1988)

Indianapolis ARTCC resectorized to accommodate the transfer of airspace from the Atlanta ARTCC. Chicago ARTCC resectored to meet the needs of increasing traffic. Cleveland and Minneapolis ARTCC's added new sectors to alleviate increased traffic in their areas.

Schedule of Events

The current and projected number of center sectors by facility is:

Year	Facility		Number of Sectors
Current	Chicago		42
	Cleveland		41
	Indianapolis		37
	Minneapolis		32
		Total	152
Projected by end of FY-89	Chicago		43
	Cleveland		42
	Indianapolis		37
	Minneapolis		33
		Total	156
Projected FY-91	Chicago		45
	Cleveland		45
	Indianapolis		41
	Minneapolis		36
		Total	167

Impact on Aviation Users

Increased capacity, reduced delays, and fuel savings.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, the Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, En route F&E Associate Program Manager, (312) 694-7422.

Related Sections of Regional Plan

Advanced Automation System (AAS) and Area Control Facilities (ACF's).

Related National Plans

National Airspace System (NAS) and National Airspace Review (NAR).

b. Center Building Expansion

Description/Purpose

The first phase of the Advanced Automation System (AAS) is a four-bay expansion of the control room upper and lower levels. The lower level was furnished for installation of the HOST computer. All Great Lakes ARTCC's computers were dedicated during FY-88. The upper level of the control room expansion will remain unfinished until the total sector suite requirements are identified. The upper level will be finished under Phase II of the AAS program.

Onsite surveys and regional inputs have identified areas which are in need of upgrading and/or modernizing in order to extend the useful life of the ARTCC buildings and plant equipment. Those improvements which logically can be incorporated into the first and the two succeeding phases of the AAS program will be accomplished. Other improvements will be made as part of a follow-on effort or as separate regional projects utilizing site-adapted A/E designs.

Another improvement will be the construction of the 2400 square foot building at the all ARTCC's. This will provide additional administrative space for contractor personnel. At the Chicago ARTCC an additional 2200 square foot building will be constructed at a later date to accommodate that facility's unique requirements.

Accomplishments (January 1, 1988-December 31, 1988)

Preplanning for the additional administrative space.

Schedule of Events

Ground breaking for the administrative space is scheduled to begin:

ARTCC	Date
Chicago	4/89
Cleveland	6/89
Indianapolis	6/89
Minneapolis	5/89

Impact on Aviation Users

Additional basement space will allow contractor's to install needed equipment associated with AAS programs. The additional administrative space will house the needed contractor personnel.

Coordination

The lead office for this program is the Airway Facilities Division, Establishment Engineering Branch, AGL-450, (312) 694-7366.

Related Section of Regional Plan

Advanced Automation System (AAS) and Area Control Facilities (ACF's).

Related National Plans

National Airspace System (NAS) Plan.

c. **Area Control Facilities (ACF's)**

Description/Purpose

An ACF is defined as an FAA ATC facility that is responsible for providing IFR separation and VFR advisory services to the users of the NAS during arrival, departure, and the en route segments of flight.

Each ACF will exercise air traffic control jurisdiction within operationally determined geographic areas. The altitude limits of an ACF may range from the surface to infinity or from an altitude above a "free standing" terminal type of ACF. Many Military facilities are also to be consolidated into ACF's.

The implementation of the ACF program will not require the development or design of any equipment unique to it. Terminal and en route "functions" will be performed with the same type of radar equipment.

Accomplishments (January 1, 1988-December 31, 1988)

An equipment summary of all systems was drafted so an ACF Backup plan could be established. Indianapolis ARTCC was selected as the model facility.

Schedule of Events

Key activities to be performed in each phase, along with start/end dates (CY) are:

Phase 1 Activities (1984-1993)

- ARTCC Building Expansion
- HOST Computer Installation
- 9020 Removal and DYSIM Relocation
- Installation of Software Improvements
- TMS improvements
- Training of En Route Controllers in the Use of Common Consoles
- VSCS Installation
- AAS Software Installation
- Initial Sector Suite Installation and Acceptance for En Route
- Installation of Full Sector Suite Capability
- Terminal Training of En Route Controllers

Phase 2 Activities (1994-1999)

- Training of Terminal Controllers in the Use of Common Consoles
- Installation of (TCCC) Tower Control Computer Complex Associated with TRACON's/TRACAB's and military facilities to be Consolidated
- Refurbishment of Old Control Rooms
- Relocation and Installation of First TRACON/TRACAB Function
- En Route Training of Terminal controllers
- Relocation and Installation of All TRACON/TRACAB Functions

Impact on Aviation Users

This program will improve the efficiency of the FAA ATC System.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, En route F&E Associate Program Manager, (312) 694-7422.

Related Sections of Regional Plan

Center building expansion and Advanced Automation System.

Related National Plans

National Airspace System (NAS) and Aviation Weather System Plans.

d. Replace Flight Data Entry and Printout Devices (FDEP)

Description/Purpose

The Flight Data Input/Output (FDIO) is a full turnkey installation. It covers replacement of the flight data entry and printout (FDEP) devices at existing air traffic control tower FDEP systems, as well as the establishment of FDIO equipment at additional airports. The FDIO

devices will be placed into existing space, so only minimal site preparation will be required in the control areas.

Accomplishments (January 1, 1988-December 31, 1988)

Interim FDIO operation was implemented between all ARTCC's in the Great Lakes Region and 36 terminal facilities.

Schedule of Events

Full FDIO testing with subsequent implementation at designated facilities is expected in CY89.

Impact on Aviation Users

The new establishments, and the implementation of full FDIO operations will allow the automated exchange of flight data which will reduce the potential for delays to air traffic.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, En route F&E Associate Program Manager, (312) 694-7422.

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

Related Sections in Regional Plan

Center building expansion and ATC HOST Computer.

Related National Plans

National Airspace System Plan.

e. **Traffic Management System**

Description/Purpose

The traffic management system will upgrade the present flow control system into a fully integrated one. This will operate at the national level through the Central Flow Control Function (CFCF) at FAA Headquarters and the local level through traffic management units (TMU's) in each ARTCC and designated level 5 terminals and later at ACF's. Phase 1 was completed earlier. Phase 2 is being implemented in two stages. Stage 1 consists of adding two color graphic Apollo DN580 processing units which include added memory and storage with supporting peripherals (color printers, Danford Serial Expansion Units, isolation transformers and switches) to each ARTCC. Stage 2 consists of adding three Metering List Displays to each ARTCC and Departure Sequencing

Program terminals to selected towers. These are connected to the Apollo DN580 computers. The two color weather displays associated with this stage are being procured as a joint buy with the Central Weather Processor project. Additional functions will be added in multiple steps aligned with the concept developments evolving from the Advanced Traffic Management System program.

One aspect of the Advanced Traffic Management System program is locating the Aircraft Situation Display (ASD) in the TMU's. One ASD was delivered to Chicago ARTCC in October with commissioning on November 10, 1988. Other ARTCC's will receive shipments at later dates.

Accomplishments (January 1, 1988-December 31, 1988)

ARTCC	Stage 1 Delivery	Stage 2 ORD	ASD ORD
Chicago	9-19-88	9-28-88	11-10-88
Cleveland	9-6-88	10-11-88	TBD
Indianapolis	8-29-88	9-19-88	TBD
Minneapolis	11-28-88	1-27-89	TBD

Schedule of Events

Additional functions will be added in multiple steps after the concepts are formalized for delivery. The Cleveland, Indianapolis, and Minneapolis ARTCC's will receive ASD's as soon as delivery schedules are formulated.

Impact on Aviation Users

State-of-the-art equipment will increase capacity will increase capacity, reduce delays, save fuel, and expand services.

Coordination

The lead office for Airway Facilities Division Program and Planning is AGL-421, En route F&E Associate Program Manager, (312) 694-7422.

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

Related National Plan

National Airspace System (NAS) and Aviation Weather System Plans.

f. **En route Automation Enhancements**

Description/Purpose

The following are automated enhancements to be made to the en route system:

1. Enhanced Direct Access Radar Channel (E-DARC) will become the primary backup system for NAS radar. The E-DARC System will provide radar mosaicing, weather data, plus altitude and slant-range correction.

2. En route Metering II (ERM) regulates aircraft into the airport terminal area at the optimum airport acceptance rate.

3. Conflict Resolution Advisory will provide automation-aided assistance to en route controllers in resolving potential traffic conflictions. Will be implemented into the HOST computer system beginning in FY90.

4. Conflict Alert IFR/VFR Mode C intruder will provide computer assistance to en route radar controllers in identifying potential conflict situations between IFR and VFR Mode C equipped aircraft.

5. Automated En Route Air Traffic Control (AERA) will provide automated tools that permit aircraft to fly optimal, fuel-efficient profiles. AERA will probe aircraft routes and detect and resolve conflicts with other aircraft, restricted areas, or severe weather.

Accomplishments (January 1, 1988-December 31, 1988)

1. E-DARC software version RAJ was implemented at all our centers, except Chicago, during 1988.

2. ERM II software has been incorporated into the NAS program. Adapted facilities receive a traffic update every 30 seconds.

Schedule of Events

1. Conflict Resolution Advisory will be incorporated into the NAS operational software after the HOST computer system is operational in 1987/1988.

2. Conflict Alert IFR/VFR Mode C Intruder has been incorporated into the NAS system and is operating as designed.

3. E-DARC S/W version RAK is being delivered to ARTCC's in March 1989.

4. AERA is in conceptual stage and its implementation is contingent upon the success of all the projects listed above. Proposed implementation is beyond 1990.

Impact on Aviation Users

Mode C transponder equipment will be required for the conflict alert IFR/VFR Model C Intruder Program and Mode S transponders for AERA.

Coordination

The lead office for E-DARC is the Airway Facilities Division, Operations Engineering Branch, AGL-430, Program Engineer, (312) 694-7443.

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, En route F&E Associate Program Manager, (312) 694-7422.

Related Sections of Regional Plan

Advanced Automation System and Area Control Facilities.

Related National Plans

National Airspace System Plan

g. **Advanced Automation System (AAS)**

Description/Purpose

The AAS will provide a new computer system capable of satisfying air traffic control needs through and beyond the year 2000 in terms of increased traffic load, increased controller/technician productivity, increased system reliability/availability, and future functional enhancements.

The AAS program basically consists of a three-phase approach as follows:

Phase 1 - IBM 3083 HOST (CCCH) has replaced the IBM 9020 A/D utilizing existing hardware.

Phase 2 - replace existing controller display work stations with new sector suite common controller work stations. These new work stations may also replace all or selected components of the existing IBM 9020E (DCC)/Raytheon (CDC) display channel computer and will interface with Phase I system.

Phase 3 - with the exception of sector suite work stations, replace all or selected components of Phase 1 and 2 hardware/software. The new hardware/software will permit the integration of en route and terminal functions and provide for a tower cab sector suite.

Accomplishments (January 1, 1988-December 31, 1988)

IBM was awarded the AAS contract August 1988.

Schedule of Events

The HOST delivery was completed on schedule (Phase 1), installation of Initial Sector Suite System (Phase 2), and replacement of all or selected components of Phase 1 and 2 hardware/software (Phase 3).

Location	Phase 1	Phase 2	Phase 3
Chicago, IL ARTCC	10/87	7/92	12/93
Cleveland, OH ARTCC	1/88	9/92	2/94
Indianapolis, IN ARTCC	4/88	10/93	3/95
Minneapolis, MN ARTCC	4/88	4/93	9/94

Impact on Aviation Users

The major impact on the aviation users will be a more efficient air traffic control system. The increased efficiency will be the result of increased controller productivity and increased computer system availability/ reliability.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch, AGL-421, is the En route F&E Associate Program manager, (312) 694-7422.

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

Related Sections of Regional Plan

Center Building Expansion, ATC HOST Computer, Area Control Facilities, Weather Systems, Communications and Surveillance

Related National Plans

National Airspace System and Aviation Weather System Plans.

CHAPTER 5. TERMINAL (ATC) SYSTEMS

The Great Lakes Region encompasses 72 terminal area air traffic control facilities. Sixty-eight facilities are staffed by FAA personnel, three are temporarily closed, and two are operated as a contract towers. Of the 68 FAA staffed towers, 35 provide radar approach control services, one provides nonradar approach control services, and the remaining 33 are Level I and II VFR control towers.

Low-activity ATCT's, including three (3) temporarily-closed facilities, are planned for conversion to contract towers. However, this program has been deferred because of budget constraints.

The National Airspace Plan provides for numerous programs which are intended to modernize the airspace system, improve operational efficiency, and promote increased safety and system capacity. The programs applicable to the Great Lakes Region are identified in the following sections of this chapter:

a. Integration of Nonradar Approach Control Facilities into Radar Approach Control Facilities
b. Digital Bright Radar Indicator Tower Equipment (DBRITE)
c. TPX-42 Replacement
d. ARTS/IIA Enhancements
e. ATCT/TRACON Establishment, Replacement, and Modernization
f. ASDE - Establish and Replace

The evolution diagram for the programs, as they pertain to the Great Lakes Region within this chapter is shown in Figure 5-1. The nomenclature used in the evolution diagram is explained in Appendix E. For more detailed discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. Integration of Nonradar Approach Facilities into Radar Facilities

Description/Purpose

To expedite the movement of air traffic by integrating the volume of air traffic now handled by nonradar approach control facilities into facilities with radar. Integration of the remaining facility will reduce the total number of operational control positions and improve service to users by eliminating delays induced by use of nonradar procedures and interfacility coordination.

Accomplishments (January 1, 1988-December 31, 1988)

None

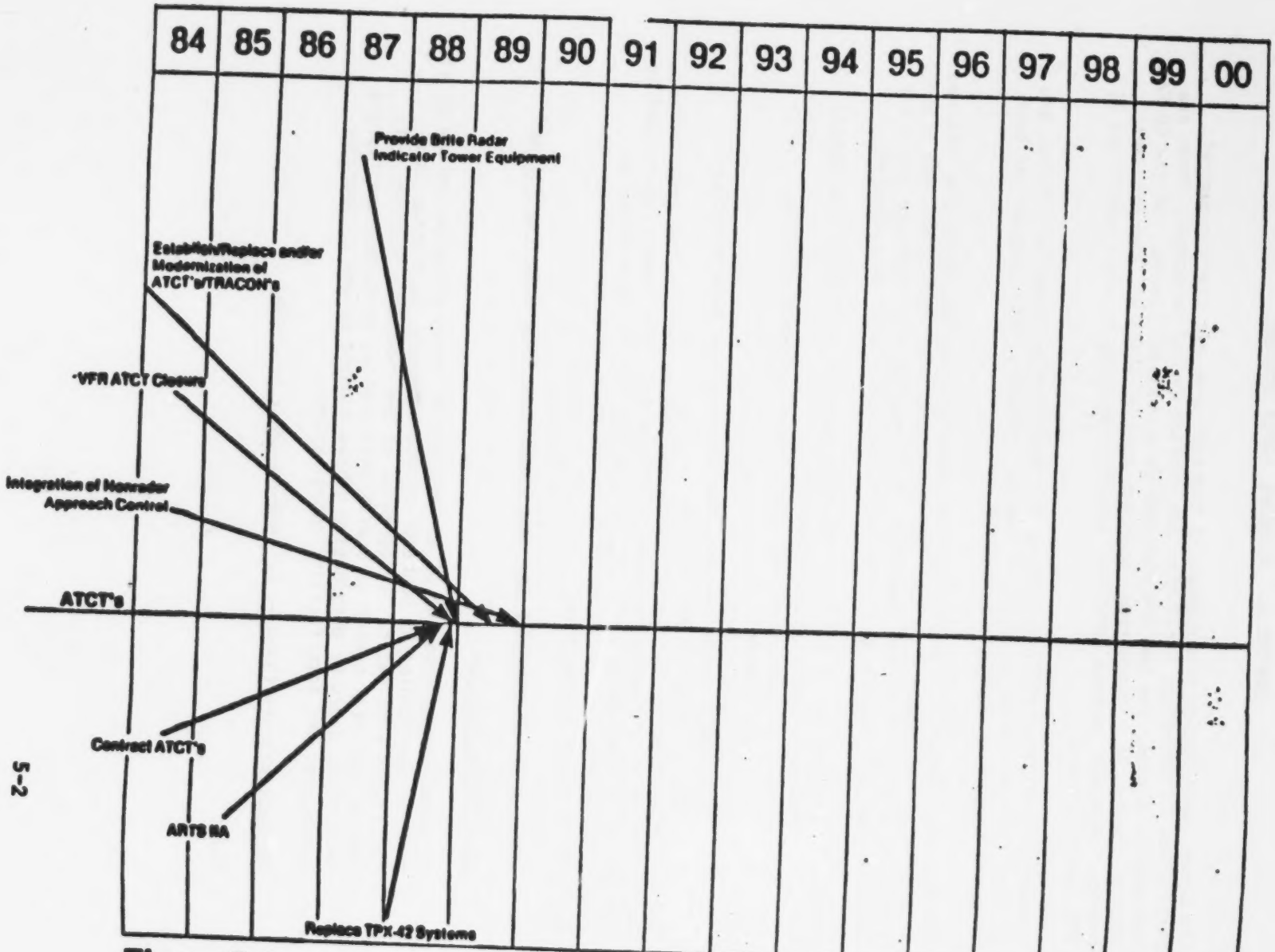


Figure 5-1

Terminal (ATC) Systems

Schedule of Events

The lone remaining nonradar approach control facility is planned for consolidation at a future date.

Nonradar Facility	Year	Receiving Radar Facility
West Lafayette, IN, ATCT	N/D	Indianapolis ARTCC

Impact on Aviation Users

The providing of radar service to the users will minimize delays and enhance safety.

Coordination

The lead office for the Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Terminal F&E Associate Program Manager, (312) 694-7590.

Related Sections of Regional Plan

None

Related National Plans

National Airspace System Plan

b. **Digital Brite Radar Indicator Tower Equipment**

Description/Purpose

DBRITE is a radar display system designed for use of the ATCT cab. DBRITE displays are also remoted via TML to satellite ATCT's in order to reduce collision risk by extending the visual range of controllers.

Accomplishments (January 1, 1988-December 31, 1988)

None.

Schedule of Events

Contract was awarded in April 1986. First equipment delivery is expected in mid 1989. The following locations are to receive radar remoting with DBRITE. The dates shown are tentative.

Site	Date	Site	Date
Aurora, Illinois	4/90	Alton, Illinois	4/90
Ann Arbor, Michigan	10/89	Appleton, Wisconsin	8/89
Cleveland, (Burke), Ohio	9/90	Rapid City, South Dakota	8/90
Grand Forks, North Dakota	8/90	Chicago (Meigs), Illinois	4/90
East St. Louis, Illinois	4/90	Crystal, Minnesota	1/90
Milwaukee, Wisconsin	9/90	Columbus (OSU), Ohio	6/90
		St. Paul, Minnesota	1/90

Note: This list does not include existing BRITE equipment which will be replaced under this program.

Impact on Aviation Users

None

Coordination

The lead office for the Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Terminal F&E Associate Program Manager, (312) 694-7590.

Related Sections of Regional Plan

None

Related National Plans

National Airspace System Plan, ARTS IIA Enhancements, TPX-42 Replacement.

c. **TPX-42 Replacement**

Description/Purpose

TPX-42 radar equipment, installed in the early 1970's, is the least sophisticated of the terminal radar automation systems. It is a nonprogrammable, numeric beacon decoder system that provides transponder-code and altitude information only.

The TPX-42 systems will be replaced with ARTS IIA equipment. This will provide the added capability of data communications with the en route centers and other terminals, alphanumeric data displayed on the controller displays, beacon-target tracking, Minimum Safe Altitude Warning (MSAW), enhancement for training purposes, and conflict alert. This region has 10 TPX-42 sites which will be updated with ARTS IIA equipment. An additional 16 sites which will be upgraded from ARTS II

to ARTS IIA are covered in Section d. Due to problems with the software for the ARTS IIA, version A2.06, TPX-42 sites will initially be installed with the older.

Accomplishments (January 1, 1988-December 31, 1988)

Peoria in December 1988; Moline in progress, Flint in progress. Available BANS/BRITE Systems have been deployed. Further sites required DBRITE Systems.

Schedule of Events

Contract was awarded to Burroughs Corporation in July 1985. Tentative equipment availability is shown for the following locations.

Site	Date	Site	Date
Flint, Michigan	4/89	Green Bay, Wisconsin	5/89
Moline, Illinois	2/89	Saginaw, Michigan	8/89
Lansing, Michigan	6/89	Fargo, North Dakota	11/89
Youngstown, Ohio	7/90	Sioux Falls, South Dakota	10/89
Peoria, Illinois	Completed	Rochester, Minnesota	9/89

Impact on Aviation Users

Improved air traffic safety and operational efficiency.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Terminal F&E Associate Program Manager, (312) 694-7590.

Related Sections of Regional Plan

Digital Brite Radar Indicator Tower Equipment, ARTS IIA Enhancements.

Related National Plans

National Airspace System Plan

d. ARTS IIA

Description/Purpose

The Automated Radar Terminal System (ARTS II) is a programmable, non-tracking data processing system. The ARTS II derives its information from the aircraft transponder via the primary and secondary terminal

circuits for the exchange of computer information. The Great Lakes Region has 16 operational ARTS II systems.

The ARTS IIA will be hardware and software improved over the existing ARTS II systems. Software or firmware will be incorporated for conflict alert, tracking, and Minimum Safe Altitude Warning (MSAW). There will be 16 ARTS IIA systems installed in this region as ARTS II enhancements. The ten systems which will be installed as TPX-42 replacements, making a total of 26 Great Lakes installations, are discussed in Section C.

Accomplishments (January 1, 1988-December 31, 1988)

ARTS II(A) Hardware change over commenced December 6, 1988. All regional ARTS II(A) sites completed adaptation requirements for new software, 2.06.

Schedule of Events

Hardware - Contract was awarded to Burroughs Corporation in July 1985. Tentative equipment availability is shown for the following locations:

Site	Equipment Delivery Date	Site	Equipment Delivery Date	Site	Equipment Delivery Date
Akron-Canton, OH	Completed	Fort Wayne, IN	Completed	South Bend, IN	Completed
Bismarck, ND	6/89	Grand Rapids, MI	6/89	Terre Haute, IN	5/89
Champaign, IL	2/89	Kalamazoo, MI	5/89	Springfield, IL	2/89
Duluth, MN	4/89	Madison, WI	4/89	Toledo, OH	Completed
Evansville, IN	2/89	Mansfield, OH	5/89		
		Muskegon, MI	4/89		
		Rockford, IL	Completed		

Software - ARTS II(A) Software (2.06) is under evaluation at the FAA Technical Center. Key site testing at Atlantic City is tentatively scheduled for July 1989.

Impact on Aviation Users

Improved operational efficiency, resulting in fuel savings and fewer delays.

Coordination

The lead office for Air Traffic Division coordination and operational requirements, AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Terminal F&E Associate Program Manager, (312) 694-7590.

Related Sections in Regional Plans

Digital Brite Radar Indicator Tower Equipment, TPX-42 replacement.

Related National Plans

National Airspace System Plan (NAS)

e. **Airport Surveillance Radar (ASR-9)**

Description/Purpose

The present terminal radar systems in the Great Lakes region consist of a mixture of vacuum-tube radars (ASR-4, -5, and -6) and solid-state radars (ASR-7 and -8). ASR-9 will enable the Great Lakes region to replace the tube-type radars. Those solid-state radars being replaced by ASR-9 will be utilized at other tube-type sites, with the result that only solid-state systems will remain. ASR-9 incorporates a dual-beam concept which will reduce ground clutter, enabling the controller to see aircraft returns more easily. Additionally, the ASR-9 incorporates a separate weather channel to display significant weather returns to the controller.

Accomplishments (January 1, 1988-December 31, 1988)

None.

Schedule of Events

Contract was awarded to Westinghouse Corporation in September 1983. Tentative equipment availability is shown for the following locations:

Site	Date	Site	Date
Toledo, Ohio	12/89	Minneapolis, Minnesota	8/90
Madison, Wisconsin	2/90	Indianapolis, Indiana	6/90
Chicago O'Hare, Illinois	2/90	Columbus, Ohio	12/90
Milwaukee, Wisconsin	3/91	Detroit, Michigan	11/90
Cleveland, Ohio	8/90	Dayton, Ohio	4/91
Chicago South, Illinois	3/90	Grand Rapids, Michigan	11/91
		Fort Wayne, Indiana	11/91

Impact on Aviation Users

Enhanced safety because of better traffic and weather advisories and improved system reliability.

Coordination

The lead office for the Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for the Airway Facilities Division, Program and Planning Branch is AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586.

Related Sections of Regional Plan

DBRITE, ARTS IIA Enhancements, TPX-42 Replacements.

Related National Plans

National Airspace System Plan

f. ATCT/TRACON Establishment, Replacement, and Modernization

Description/Purpose

This prgram provides for the establishment/replacement/modernization of ATCT's/TRACON's. Many facilities have passed or will surpass their design life cycle by the year 2000 and will require major expenditure of funds to upgrade/replace environmental systems and operational and administrative spaces.

The FAA is developing national standards and plans to make national equipment purchases. Construction will be by regional contracts, with national architectural engineers providing support to regions for site-specific designs.

Proposals for modernization include, but are not limited to, the following:

1. Add operational positions.

2. Provide additional operational/administrative space.

3. Replace obsolete operational equipment.

4. Replace or rehabilitate obsolete or unreliable engine generator and ventilating, and heating, cooling (HVAC) systems.

5. Rehabilitate operational and administrative space.

7. Establish TRACON's to relieve crowding in qualifying TRACAB's.

Accomplishments (January 1, 1988-December 31, 1988)

1. ATCT Replacement/Relocation

   a. Cleveland (CLE), Ohio ATCT commissioned April 1988.

2. Modernize/Improve

   a. Detroit City (DET), Michigan ATCT cab modernization completed July 1988.

   b. Columbus (OSU), Ohio ATCT HVAC upgraded July 1988.

3. Establish Tower

   a. Waukegan (UGN), Illinois ATCT commissioned October 1988.

4. Other Modernization Projects

   a. Cleveland Hopkins (CLE), Ohio ATCT data system display installed April 1988.

   b. Milwaukee Mitchell (MKE), Wisconsin ATCT data system display installed May 1988.

   c. Chicago O'Hare (ORD), Illinois ATCT color weather radar installed May 1988.

   d. Chicago (ORD), Illinois ATCT data display system installed August 1988.

   e. Indianapolis (IND), Indiana ATCT data system display installed November 1988.

   f. Detroit Metro (DTW), Michigan ATCT data display system installed December 1988.

   g. Minneapolis (MSP), Minnesota ATCT data display system installed December, 1988.

   h. Chicago (ORD), Illinois ATCT Aircraft Situation Display installed November 1988.

Schedule of Events

The schedule for projects is as follows:

Project	Commissioning/Service Data
Replace ATCT	
Detroit (DTW), MI	4/91
Chicago (ORD), IL	FY92

Other Modernization Projects	Commissioning Service Data
Flint (FNT), MI - Provide 3rd radar display	2/89
Jackson (JXN), MI - Cab/HVAC modernization	6/89
Fort Wayne (FWA), IN - Building improvements	N.D
Minneapolis (MSP), MN - Building improvements	9/89
Chicago (ORD), IL - Administrative Area improvements	4/89
Akron (AKR), OH - Replace HVAC	N.D.
Ann Arbor (ARB), MI - Replace HVAC	5/89
Benton Harbor (BEH), MI - Replace HVAC	N.D.
Bloomington (BMI), IL - Replace HVAC	1/89
Bloomington (BMG), IN - Replace HVAC	10/89
East St. Louis (CPS), IL - Replace HVAC	N.D.
Mansfield (MFD), OH - Replace HVAC	10/89
Columbus Port (CMH), OH - Data display system	2/89
Madison (MSN), WI - Data display system	12/89
Grand Rapids (GRR), MI - Data display system	12/89
Rockford (RFD), IL - Data display system	12/89
Champaign (CMI), IL - Data display system	12/89
Lansing (LAN), MI - Data display system	12/89
Akron Canton (CAK), OH - Data display system	12/89
Flint (FNT), MI - DAta Dispaly System	12/89
Springfield (SPI), IL - Data display system	12/89
Chicago O'Hare (ORD), IL - Upgrad HVAC	N.D.
Chicago O'Hare (ORD), IL - Replace voice recorders	6/89
Chicago O'Hare (ORD), IL - Replace 4 horizontal radar displays with 9 vertical radar displays	11/89

N.D. = Dates Not Determined

Additional national and regional modernization plans for ATCT's/TRACON's were submitted in indicated fiscal year's F&E budget.

FY-1989

(a) Minneapolis, Minnesota - 2nd ground control position N.D.

(b) Minneapolis, Minnesota - Cab modernization	N.D.
(c) Pontiac, Michigan - Additional operating position	N.D.
(d) Pontiac, Michigan - Cab modernization	N.D.
(e) Detroit, Michigan - Replace ATCT	N.D.
(f) Grand Rapids, Michigan - Cab modernization	N.D.
(g) Lansing, Michigan - Cab modernization	N.D.
(h) Toledo, Ohio - Adm./cab modernization	N.D.
(i) Youngstown, Ohio - Data display system	N.D.
(j) Moline, Illinois - Data display system	N.D.
(k) Fort Wayne, Indiana - Data display system	N.D.
(l) South Bend, Indiana - Data display system	N.D.
(m) Evansville, Indiana - Data display system	N.D.
(n) Kalamazoo, Michigan - Data display system	N.D.
(o) Peoria, Illinois - Data display system	N.D.
(p) Toledo, Ohio (YNG) - Data display system	N.D.
(q) Grand Rapids, Michigan - Improve structure and HVAC	N.D.
(r) Lansing, Michigan - Improve HVAC	N.D.

FY-1990

(a) Columbus, Ohio (CMH) - Tracon modernization	N.D.
(b) Columbus, Ohio (CMH) - Additional Tracon position	N.D.
(c) Green Bay, Wisconsin - Information display system	N.D.
(d) Saginaw, Michigan - Information display system	N.D.
(e) Chicago, Illinois (MDW) - Information display system	N.D.
(f) Rochester, Minnesota - Information display system	N.D.
(g) Terre Haute, Indiana - Information display system	N.D.
(h) Muskegon, Michigan - Information display system	N.D.

(i) Mansfield, Ohio - Information display system N.D.

(j) Duluth, Minnesota - Information display system N.D.

(k) Bismarck, North Dakota - Information display system N.D.

(l) Fargo, North Dakota - Information display system N.D.

(m) Sioux Falls, South Dakota - Information display system N.D.

(n) Minneapolis, Minnesota - Additional Tracon position N.D.

(o) Fargo, North Dakota - Convert Tracab to Tracon N.D.

(p) Youngstown, Ohio (YNG) - Cab modernization N.D.

(q) Chicago, Illinois (MDW) - Cab modernization N.D.

(r) Kalamazoo, Michigan (AZO) - Cab modernization N.D.

(s) Chicago, Illinois (ORD) - Replace ATCT N.D.

FY-1991

(a) Minneapolis, Minneapolis (MSP) - Replace ATCT N.D.

(b) Chicago Midway, Illinois (MDW) - Replace ATCT N.D.

(c) East St. Louis, Illinois (CPS) - Replace ATCT N.D.

(d) St. Paul, Minneapolis (STP) - Replace ATCT N.D.

Impact on Aviation Users

These projects are being undertaken to improve the operating efficiency of the FAA.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Terminal F&E Associate Program Manager, (312) 694-7590.

The lead office of Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

Related Sections of Regional Plan

Replace TPX-42 Systems and provide ARTS IIA Displays.

Related Projects in National Plans

National Airspace System Plan

CHAPTER 6. FLIGHT SERVICE STATION SYSTEMS

There are 24 Flight Service Stations (FSS's) in the Great Lakes Region, which provide three broad categories of service.

a. Preflight pilot briefings on flight conditions and all flight-related information.

b. Handling flight plans and related aircraft movement information.

c. Providing inflight communications, advisories and assistance.

FSS's are labor intensive due to lack of state-of-the-art equipment.

Automation of the FSS's has begun and by 1993 the 24 existing FSS's in the Great Lakes Region will be consolidated into nine fully automated FSS's (AFSS). (Decatur and Quincy, Illinois FSS's will be consolidated into the St. Louis, Missouri AFSS.) These AFSS's will be capable of handling the projected aviation increase over the next 20 years and will allow a substantial reduction in operating cost over the present system. Figure 6-2 depicts the location of the existing and future FSS's/AFSS's within this Region.

Enhancements to the automation equipment will begin to appear in the early 1990's. These enhancements will allow pilots direct access, via home computers and telephones, for flight planning and flight plan filing, without the aid of the FSS specialist.

Each AFSS will provide service that is equal or superior to that now being provided. Existing air-ground communications will be retained and, in some areas, coverage will be improved. Weather observations will continue. FSS specialists will continue to be trained and certified in their ability to provide service for pilots, and they will notice a significant improvement in the quality and timeliness of the information and service provided. There will be no derogation of service or safety during or after the transition to the new Automated FSS system.

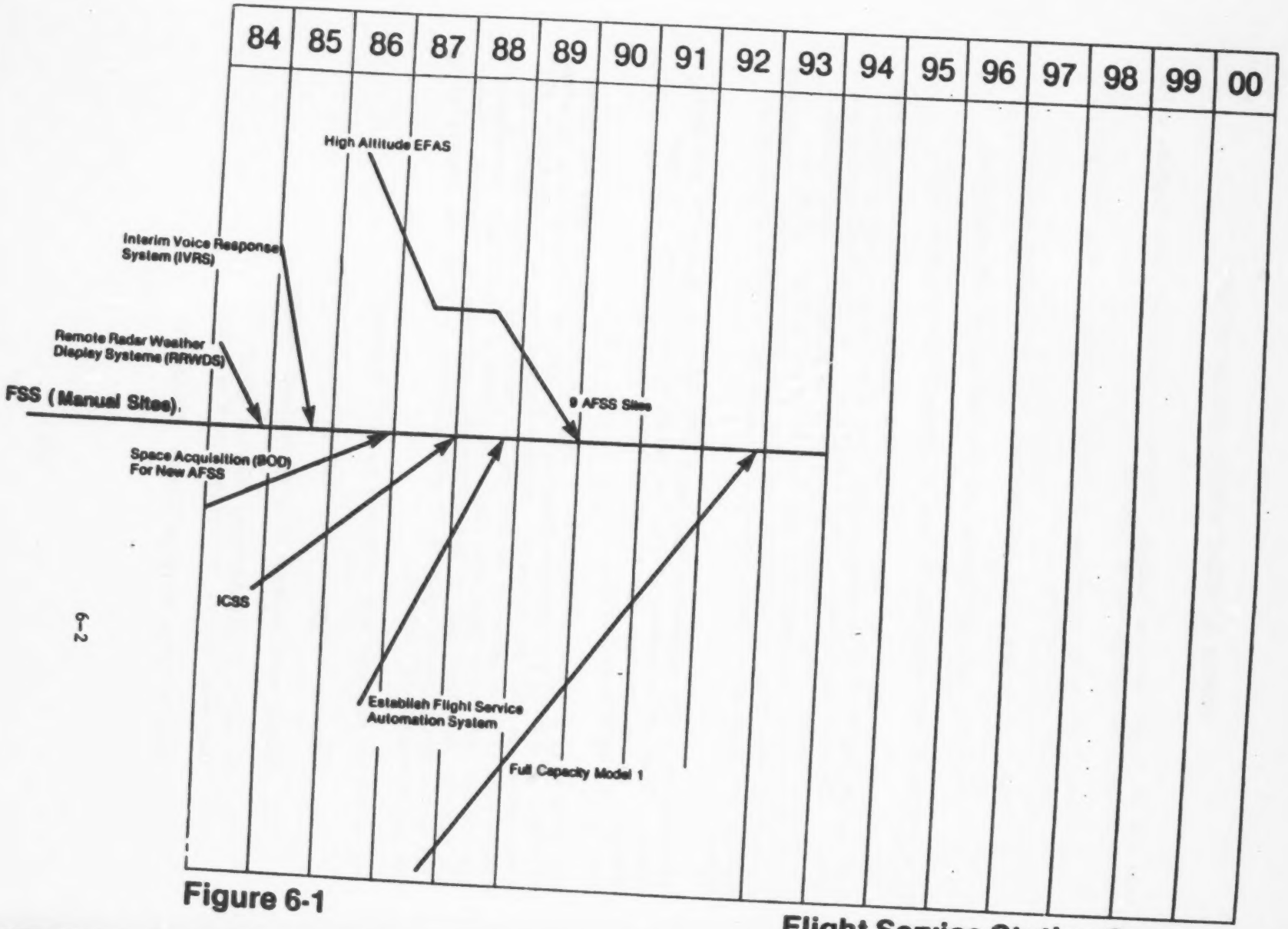
The following sections are contained in this chapter:

a. Automated Flight Service Station Program (AFSS)

b. Remote Radar Weather Display Systems (RRWDS)

c. En route Flight Advisory Service (EFAS)
(Current/Future, including High Altitude)

d. Interim Voice Response System (IVRS/VRS)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High Altitude EFAS
Interim Voice Response System (IVRS)
Remote Radar Weather Display Systems (RRWDS)
FSS (Manual Sites)
9 AFSS Sites
Space Acquisition (BOD) For New AFSS
ICSS
Establish Flight Service Automation System
Full Capacity Model 1

Figure 6-1

1988 Flight Service Stations
Great Lakes Region

1993 Automated Flight
Service Stations
Great Lakes Region

Figure 6-2

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 6-1. The nomenclature used in the evolution diagram is explained in Appendix E. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. **Automated Flight Service Station Program (AFSS)**

Description/Purpose

In order to bring state-of-the-art automation to the FSS systems, enlarged buildings configured to the requirements of the new automation equipment will be required. As the new AFSS's are staffed, the existing FSS's can be decommissioned.

Accomplishments (January 1, 1988-December 31, 1988)

1. Cincinnati/Lunken, Decatur, Zanesville, Wausau, LaCrosse, Saginaw, Traverse City, Jackson, Jamestown and Dickinson FSS's were closed during 1988.

2. Color weather graphic systems have now been installed at all nine AFSS's

GREAT LAKES REGION
AFSS IMPLEMENTATION SCHEDULE

AFSS SITE	FSS's TO BE CONSOLIDATED	IDENT	BOD	OMSN W/LABS	ICSS DLVR	ICSS ACCEPT	MODEL 1 SHIP	MODEL 1 OMSNG	MODEL 1 FULL CAPACITY DLVR/OMSN	CONSOLIDATED DECOMMISSION EY	REMARKS
Cleveland, OH		CLE	11/82	11/82	10/86	4/3/86	5/85	2/12/86	8/91	N/A	OMSN Model 1 with CLE Resources
	Youngstown, OH	YNG								10/10/89	
	Zanesville, OH	ZZV								3/15/88	
	Findlay, OH	FDY								10/10/89	
Dayton, OH		DAY	12/83	12/83	1/86	4/25/86	5/85	2/12/86	1/91	N/A	OMSN Model I with DAY Resources
	Columbus, OH	OMH								9/30/87	
	Cincinnati, OH	LUK								10/04/88	
Terre Haute, IN		HUF	10/83	6/85	1/85	6/85	7/85	4/30/86	11/90		HUF and LAF resources required for Model 1
	Terre Haute, IN	HUF								6/85	
	Lafayette, IN	LAF								7/85	
	Indianapolis, IN	IND								9/15/87	
	Fort Wayne, IN	FWA								10/27/87	
	South Bend, IN	SBN								8/29/89	
Green Bay, WI		GRB	12/83	8/85	4/85	7/9/85	7/85	4/30/86	7/90		GRB and MKE resources required for Model 1
	Green Bay, WI	GRB								8/85	
	Milwaukee, WI	MKE								8/85	
	Houghton, MI	CMX								10/13/87	
	La Crosse, MI	LSE								3/15/88	
	Marquette, MI	MQT								TBD	
	Wausau, WI	AUW								7/19/88	
	Eau Claire, WI	EAU								11/07/89	
Kankakee, IL		IKK	9/85	NA	10/86	7/86	2/86	4/87	6/90		DPA resources required to OMSN new AFSS
	DuPage, IL	DPA								4/87	
	Rockford, IL	RFD								10/03/89	

AFSS SITE	FSS's TO BE CONSOLIDATED	IDENT	BOD	CMSN W/LABS	ICSS DLVR	ICSS ACCEPT	MODEL 1 SHIP	MODEL 1 CMSNG	MODEL 1 FULL CAPACITY DLVR	CONSOLIDATED DECOMMISSION	REMARKS
Princeton, MN		PNM	11/85	NA	1/86	6/86	5/86	6/87	4/90		MSP resources required to CMSN new AFSS
	Minneapolis, MN	MSP									
	Rochester, MN	RST								6/87	
	Redwood Falls, MN	RWF								4/19/89	
	Alexandria, MN	AXN								3/01/90	
	Hibbing, MN	HIB								10/17/89	
										05/01/90	
Lansing, MI		LAN	11/85	NA	4/86	8/86	7/86	12/86	6/90		
	Lansing, MI	LAN									
	Detroit, MI	DET								12/86	
	Jackson, MI	JXN								9/30/87	
	Saginaw, MI	MBS								7/19/88	
	Pellston, MI	PLN								4/12/88	
	Traverse City, MI	TVC								3/01/89	
										5/10/88	
Grand Forks, ND		GFK	8/86	NA	4/87	5/87	12/86	8/87	4/92		
	Grand Forks, ND	GFK									
	Jamestown, ND	JMS								8/87	
	Dickinson, ND	DIK								3/29/88	
	Minot, ND	MOT								10/18/88	
										10/24/89	
Huron, SD		HON	10/86	9/87	6/87	7/87	None	None	12/92		
	Huron, SD	HON									
	Watertown	ATY								9/87	
	Aberdeen, SD	ABR								TBD	
	Pierre, SD	PIR								TBD	
	Rapid City, SD	RAP								TBD	
										TBD	

NOTE:

1. All equipment dates are tentative and subject to adequate funding.

2. BOD - building occupancy date; i.e., the date the building was available to the FAA to begin installing equipment, consoles, power, etc.

3. LABS - leased service A and B system, i.e., a leased weather distribution and message distribution system.

4. CMSNG - commissioning
   DECMSN - decommissioning
   TBD - to be determined
   M-1 - Model 1
   DLVY - delivery
   ICSS - Integrated Communications Switching System
   CMSN - Commission

Impact on Aviation Users

There will be a significant improvement in the quality and timeliness of information and service rendered to the users at less cost to the taxpayer. There will be reduced opportunity for pilot walk-in face-to-face briefings and airport advisories will become nonexistent. These two items are not considered significant to the safe and efficient operation of aircraft.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Flight Service F&E Associate Program Manager, (312) 694-7591.

Related Sections of Regional Plan

Communication, Weather, and Surveillance

Related National Plans

National Airspace System Plan and Aviation Weather Systems Plan

b. **Radar Remote Weather Displays System (RRWDS)**

Description/Purpose

The installation of the RRWDS has provided improved weather radar information to the aviation user, thereby increasing flight safety. This has provided real-time weather and intensity levels to the Center Weather Service Units (CWSU's) located at the four centers and the four FSS's (those that provide en route flight advisory service) within our Region.

This equipment provides weather radar information from 77 National Weather Service and 57 FAA long-range radar sites.

Accomplishments (January 1, 1988-December 31, 1988)

Installation of RRWDS is complete at the Chicago, Minneapolis, Cleveland, Terre Haute FSS's. The RRWDS equipment was removed from Grand Forks and Huron FSS's and relocated to Cleveland and Terre Haute AFSS's.

Schedule of Events

The RRWDS program will be enhanced beginning in 1990 with a national color weather graphics program.

Impact on Aviation Users

The users of the National Airspace System will have access to more accurate descriptions of storm systems and more accurate forecasts of location, evaluation, and trajectory of the storm systems.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Flight Service F&E Associate Program Manager, (312) 694-7591.

Related Sections of Regional Plan

Weather Systems

Related National Plans

National Airspace System Plan and Aviation Weather System Plan

c. **En Route Flight Advisory Service (EFAS)**

Description/Purpose

EFAS is a service provided by the FSS specialists at four of the 24 FSS's within our Region. It is specifically designed to provide en route aircraft with timely weather advisories on 122.0 MHz. High altitude aircraft frequently interfere with lower altitude aircraft attempting to utilize this service. In order to remedy this, the FAA is implementing separate frequencies in addition to the present 122.0 MHz and stratify frequencies according to altitude.

FSS's within the Great Lakes Region that provided En route Flight Advisory Service are:

1. Kankakee, Illinois
2. Cleveland, Ohio
3. Princeton, Minnesota
4. Terre Haute, Indiana

Accomplishments (January 1, 1988-December 31, 1988)

High altitude outlets were established at Salem, Michigan, Buffalo, New York, Pittsburgh, Pennsylvania, Huron, South Dakota, Indianapolis, Indiana, and Charleston, West Virginia.

Schedule of Events

By the end of 1987, the EFAS functions were relocated to the following AFSS's:

1. Princeton, Minnesota (From Minneapolis, MN, Grand Forks, ND, and Huron, SD)

2. Kankakee, Illinois (From Chicago, IL)

As shown in Figure 6c-1, the new EFAS network will expand user coverage.

Impact on Aviation Users

The users will have increased coverage at both low and high altitudes and will encounter less frequency interference.

Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Flight Service F&E Associate Program Manager, (312) 694-7591.

Related Sections of Regional Plan

Weather Systems

Related National Plans

National Airspace System and Aviation Weather System Plans

d. Interim Voice Response System (IVRS/VRS)

Description/Purpose

The Interim Voice Response System for pilot self-briefing will permit pilots to retrieve information directly from an automated weather data base by telephone. This will assist in meeting the demand for service during the transition to FSS automation.

IVRS will provide the users with the following products: Alert Weather Watch, Convective SIGMET's, Hourly Surface Observations, Terminal Forecasts, Winds Aloft Forecast, and Transcribed Weather En Route Broadcast (route forecasts).

Accomplishments (January 1 - December 31, 1988)

None.

Schedule of Events

Nationally, this service will be provided at 24 metropolitan areas. Great Lakes Region will provide this service at: Chicago, Detroit, Columbus, and Minneapolis.

Installation of the first IVRS began in mid-1985, with the last system being installed in 1986.

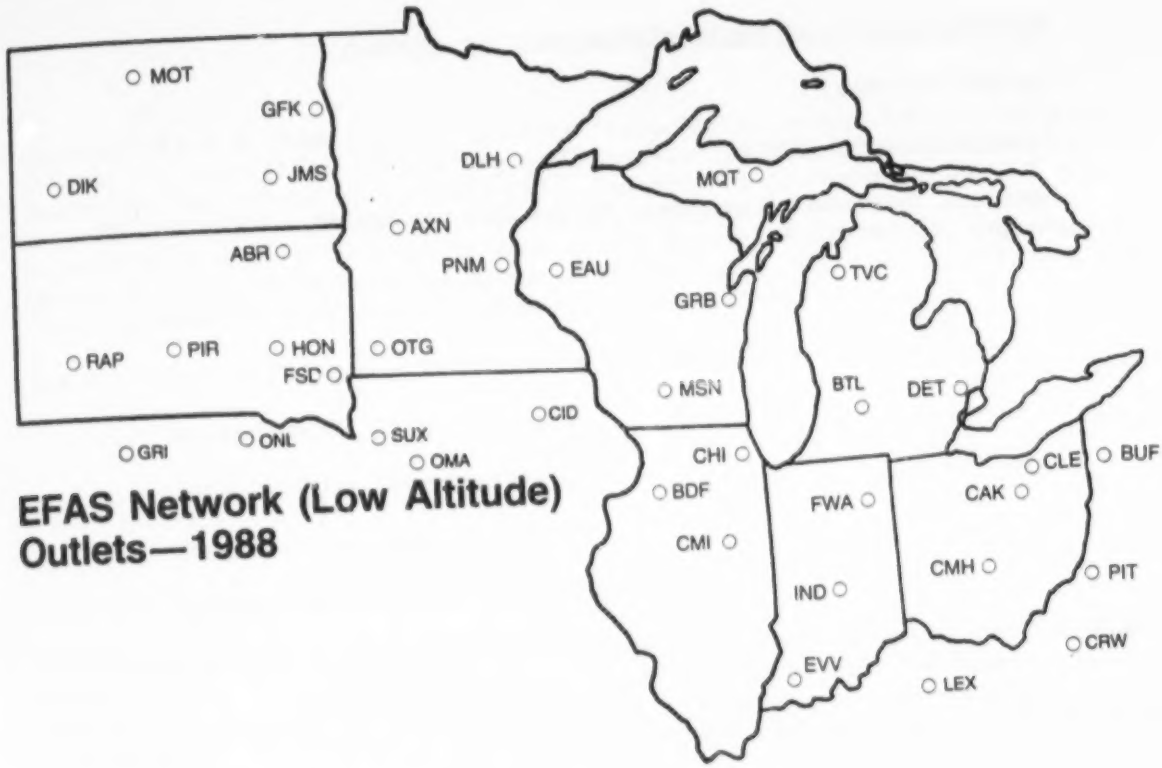
Impact on Aviation Users

Pilots will be able to access the system via a touch-tone phone or terminal computer and retrieve a number of weather products without briefer intervention.

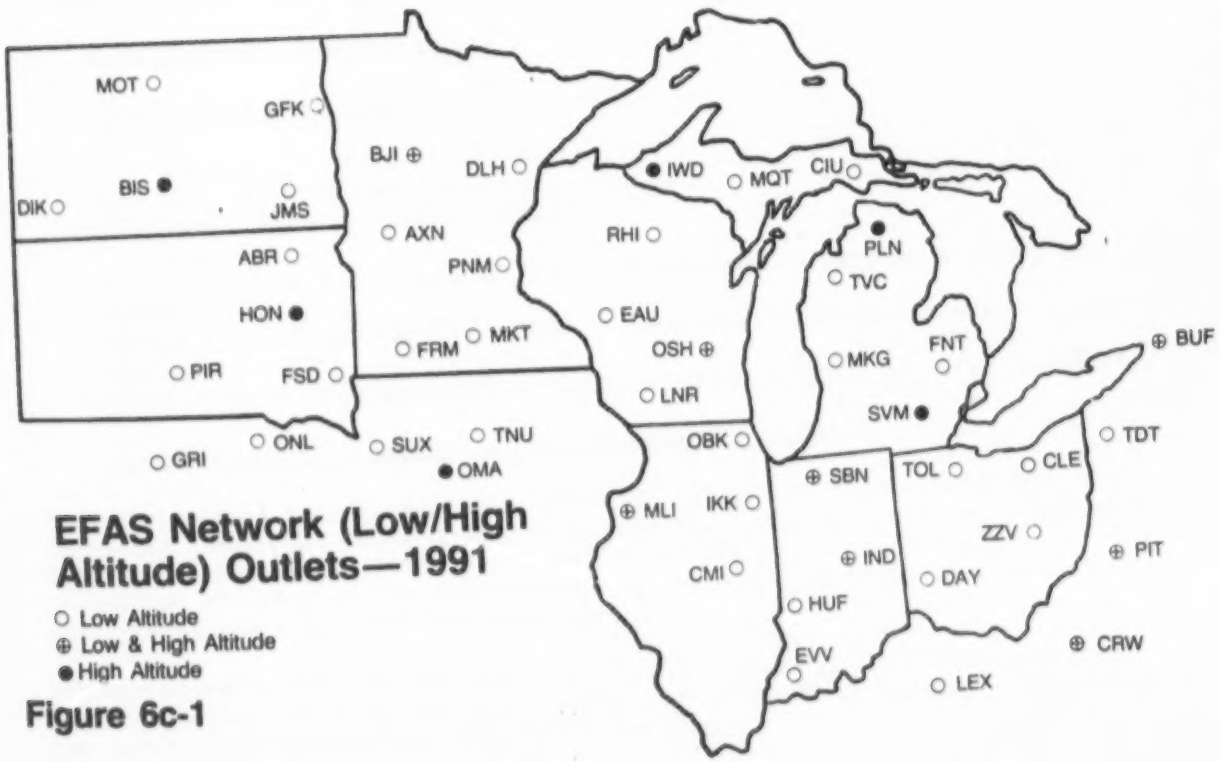
Coordination

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Flight Service F&E Associate Program Manager, (312) 694-7591.



EFAS Network (Low Altitude) Outlets—1988



EFAS Network (Low/High Altitude) Outlets—1991

○ Low Altitude
⊕ Low & High Altitude
● High Altitude

Figure 6c-1

Related Sections of Regional Plan

Weather Systems

Related National Plans

National Airspace System Plan, Flight Service Systems, and Aviation Weather System Plan

CHAPTER 7. COMMUNICATIONS SYSTEM

Communications Systems provide the vital link for voice and data transmission between FAA facilities and the users (Ground-to-Air) and between manned and remote FAA facilities (Interfacility). Emphasis is on improvements and cost reduction. Major improvements will be upgrading to solid-state equipment, networking to ensure coverage in most of the Region of 2,000 feet above terrain and to the surface in terminal areas, with the least number of facilities, and an integrated NAS interfacility communications system.

The following sections are contained in this chapter:

a. Ground-to-Air Communications

b. Interfacility Communications

c. Intrafacility Communications

d. National Radio Communication System

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 7-1. The nomenclature used in the evolution diagram is explained in Appendix E. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. Ground-to-Air Communications

Description and Purpose

The present ground-to-air communication system in the Region consists of 425 facilities connecting pilots with centers, towers, and flight service stations. Facility types include:

Remote Control Air-Ground (RCAG) - communications between aircraft and Centers
Remote Transmitter/Receiver (RTR) - communications between aircraft and towers
Remote Control Outlets (RCO) - communications between aircraft and FSS's.

Accomplishments (January 1, 1988-December 31, 1988)

A communications network designed specifically for the Aurora ARTCC was completed. Work has begun on the high priority projects including a new RCAG facility at Kankakee, Illinois. A portion of the required funding to accomplish the rest of the improvements was received by the region and project assignments and schedules have been made.

Similar networks for the Indianapolis, Oberlin, Farmington ARTCCs have also been completed. Work on the establishment of a new RCAG channel to support a new sector for the Oberlin, Ohio ARTCC has begun.

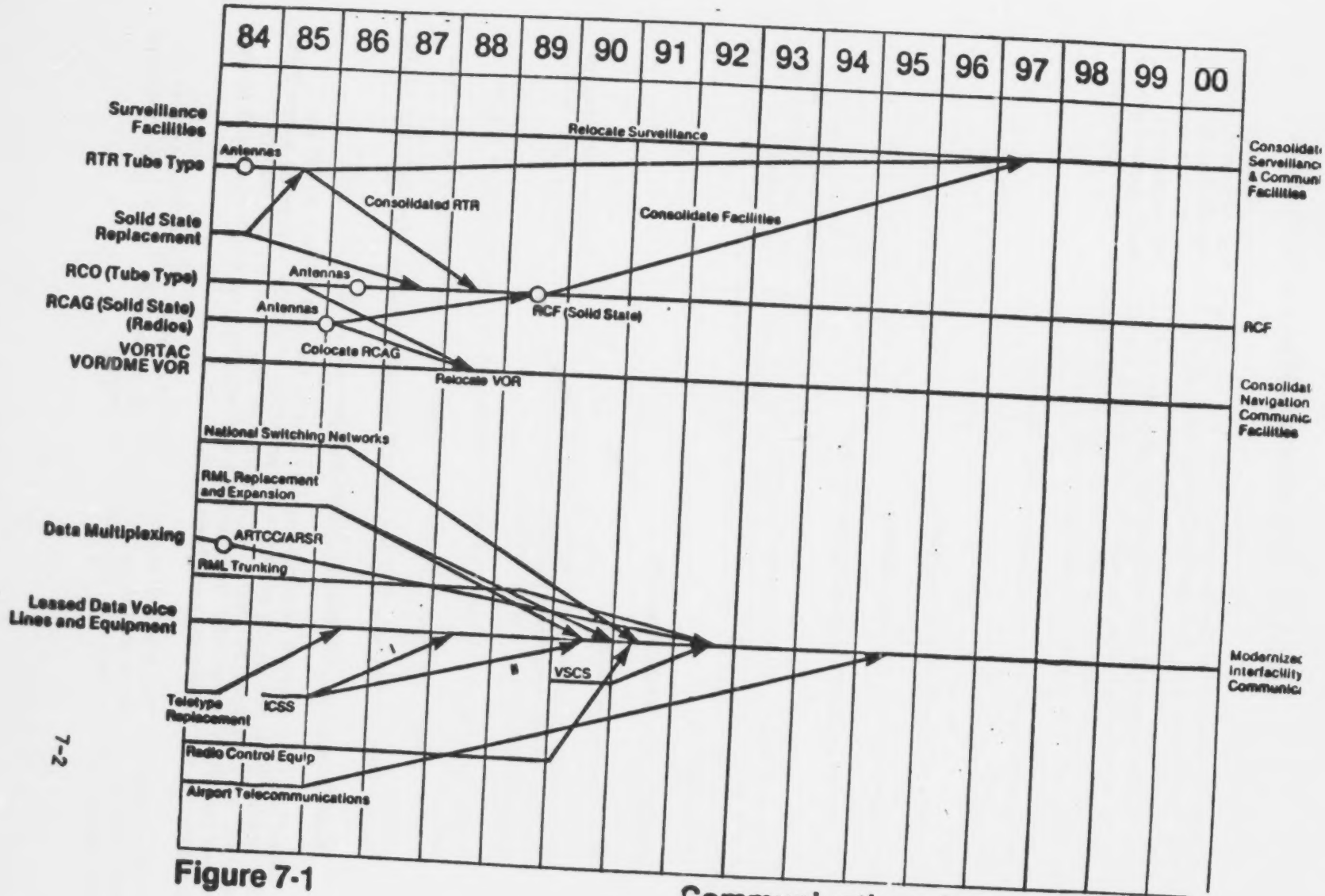


Figure 7-1 Communications Systems Evolutic

Schedule of Events

1. Installation of BUEC Patch Panels at each ARTCC. Projected completion dates for all ARTCCs is September 1989.

2. All ARTCCs except Farmington, Minnesota ARTCC have replaced the RCAG control equipment with solid state GRIMM digital control equipment. Spares for this equipment have been ordered and will be distributed to the ARTCCs and their remote sites.

3. Complete video site survey at all ARTCCs and RCAGs for the Radio Control Equipment (RCE) program and begin site preparation at both the ARTCCs and the RCAG facilities.

4. New ICSS type equipment will be installed at Minot, North Dakota and Cincinnati, Ohio (Lunkin).

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Communication/Interfacility F&E Associate Program Manager, (312) 694-7587.

The lead office for the networking program is the Airway Facilities Division, Operations Engineering Branch, AGL-430, (312) 694-7331.

The lead office for Air Traffic Division coordination and operational requirements is AGL-550, Manager, Automation and Planning Branch, (312) 694-7484.

Impact on Aviation Users

Reduction in frequency interference.

Related National Plans

National Airspace System Plan
National Communications Network Plan

b. **Interfacility Communications**

Description and Purpose

A more efficient and cost-effective interfacility communications system will be developed through the following programs:

Data Multiplex Network - combining several low-speed telco circuits into a single medium- or high-speed circuit through the use of multiplexing modems.

RML Replacement and Expansion - replacing current RML equipment with modern voice and data-carrying microwave equipment, then adding new microwave route to complete long-haul point-to-point voice and data network. This new system will be known as the Radio Communications Link (RCL) system.

Interfacility Network - fully utilizing the capacity of the new RCL to reduce leased telecommunications mileage and, hence, cost.

Accomplishments (January 1, 1988-December 31, 1988)

1. Phase III of the Data Multiplexing Program has begun and equipment is arriving in the field.

2. Regional requirements for the Data Concentration Exchange (DCX) were developed for the Traffic Management Unit (TMU), Maintenance Management System (MMS), and the expansions of the Computer Based Instruction (CBI) networks.

3. NADIN 1A was commissioned and is on line.

4. RCL path surveys by AT&T, on the expansions segments, is continuing.

5. The RCL London, Ohio and Lynch, Tennessee to Indianapolis have been commissioned.

6. The RCL network routing was reduced (miles and sites) by the program office to save program dollars and resources. The RCL baseline has been revised to reflect these changes. In summary, the West Branch segment was dropped from the baseline and a new route between Minneapolis and Kansas City was added. Negotiations with U.S. Sprint to purchase two of their segments began (ZAU-St. Louis and ZAU-ZID). Also the routing between La Grange and Detroit through the upper middle of Michigan was dropped and the new route is a straight line shot to Ottawa Lake, Michigan from La Grange, Indiana.

Schedule of Events

1. The RML replacement schedule is:

Link/Segment	Completion Date
Indianapolis-Lynch	Commissioned
Aurora-LaGrange	1st QTR FY-88
Oberlin-Danville	1st QTR FY-90
Oberlin-Oakdale	1st QTR FY-90
Indianapolis-London	Commissioned
Aurora-St. Louis	1st QTR FY-90
Oberline-Detroit	2nd QTR FY-89
Farmington-Horicon	3rd QTR FY-90

Link/Segment	Completion Date
Aurora-Horicon	2nd QTR FY-89
La Grange-Detroit	4th QTR FY-89
Farmington-Kansas City	1st QTR FY-90
London-Bedford	3rd QTR FY-90
Indianapolis-Joelton	3rd QTR FY-90
Aurora-Indianapolis	2nd QTR FY-90

2. The systems engineering of all the RCL segments were completed May 1988. All requests for frequency assignment have been completed.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Communication/Interfacility F&E Associate Program Manager, (312) 694-7587.

The lead office for the "backbone" and "trunking" studies is the Airway Facilities Division, Operations Engineering Branch, AGL-430, (312) 694-7496.

Impact on Aviation Users

This project is being undertaken solely to improve the operating efficiency of the FAA.

Related Sections in the Regional Plan

Any facility with voice or data communications.

Related National Plans

National Airspace System Plan.

c. **Intrafacility Communication System**

Description and Purpose

A more efficient and cost effective intrafacility communication system will be developed through the following programs:

Integrated Communications Switching System (ICSS) - a state-of-the-art voice communications switching system incorporating intercom, interphone, and air/ground communications.

Voice Switching and Control System (VSCS) - a system designed to satisfy the communication needs of an area control facility (ACF).

Accomplishments (January 1, 1988-December 31, 1988)

ICSS was installed at Detroit City, Michigan, Cleveland Hopkins, Ohio, and Waukegon, Illinois. In addition, TELRAD, an administration telephone system, was installed at Kalamazoo, Michigan and Muskegon, Michigan. These ATCTs were the first in the Great Lakes Region to receive ICSS equipment and were not equipped with a standard administration telephone system.

Schedule of Events

1. ICSS equipment will be installed at the following rates:

Facility Type	FY-84	FY-85	FY-86	FY-87	FY-88	FY-89	FY-90
Towers	6	6	9	4	3	2	0
AFSS	0	3	4	2	0	0	0
TOTAL	6	9	13	6	3	2	0

2. VSCS equipment will begin installation in FY-90.

Coordination

The lead offices for Airways Facilities Division, Program and Planning Branch, is AGL-422, Communication/Interfacility F&E Associate Program Manager, (312) 694-7587 and AGL-421, En Route F&E Associate Program Manager, (312) 694-7422.

Impact on Aviation Users

None - This project is being undertaken solely to improve the operating efficiency of the FAA.

Related Sections of Regional Plan

ACF
Tower/TRACON Replacement and Modernization
AFSS
AAS

Related National Plans

National Airspace System Plan

d. National Radio Communications System (NARACS)

Description/Purpose

The National Radio Communication System (NARACS) will provide a medium for command, control, and communication during periods of national or local emergency. Additionally, the system will be available on a day-to-day basis for routine communications needs of Airways Facilities technicians, accident investigators, and aviation security personnel. The Regional Communications System will provide local area land mobile communications

service at locations with significant FAA presence or volume of air traffic. It will also provide for point-to-point communications between selected FAA field offices and facilities within the Region. Portable communications packages will be provided for use in areas not covered by permanently installed equipment. This program is divided into the following six implementation phases:

Phase I:	Communications Control Center, FAA Headquarters, and three National Emergency Operations Facilities.
Phase IA:	COMSE network upgrade to AUTODIN.
*Phase II:	Eastern and Western networks (HF SSB). (Completed)
*Phase III:	Regional networks (VHF/FM).
Phase IV:	Duplex system for backbone network.
Phase IVA:	Federal secure telephone network.

*only these two phases addressed in the Great Lakes Region Plan at this time.

Accomplishments (January 1, 1988-December 31, 1988)

Phase III: Regional network; Equipment purchased from national contract to be delivered to all sectors simultaneously. Installation of repeaters will be performed by FAA or contractor.

(a) 1st coverage areas operational in October 1986, Michigan Sector.
(b) All coverage areas operational in 1988, all Sectors.

Phase II: Eastern and Western networks; HF SSB radio equipment purchased from national contract to be delivered to ARTCC sector 30 days prior to installation. Installation of equipment (screen room, console, antenna tower, acceptance test) to be performed by a national contractor. The Sector to witness the acceptance testing and perform their own JAI.

(a) Location	Planned Date
Farmington, MN ARTCC	01-April-1988
Indianapolis, IN ARTCC	06-May-1988
Cleveland, OH ARTCC	01-April-1988
Chicago, IL ARTCC	Planned mid-1989
Chicago, IL Regional Office	Planned mid-1989

Schedule of Events: Phase IV and IVA planned for FY-90.

Coordination Required

The lead office for Airway Facilities Division is AGL-432 Commaids/Interface/Weather Engineering Sector (312) 694-7331. Program responsibility is AGL-421 (312) 694-7468.

Impact on Aviation Users

This project is being undertaken solely to improve the operating efficiency of the FAA. Through the use of NARACS, FAA will be able to reduce dependence on Telco landlines for communication and disseminate information on a "realtime" basis.

CHAPTER 8. NAVIGATION AND LANDING SYSTEMS

Navigation and landing systems provide ground-to-air guidance to aircraft. Major improvements will be upgrading to solid-state equipment. This includes the present civil en route navigation system, consisting of the VHF Omni-Directional Range (VOR) with Distance Measuring Equipment (DME) or the military Tactical Air Navigation (TACAN) and most of the present Instrument Landing Systems (ILS), which provide airport precision approach and landings. New systems to be placed in operation include the Microwave Landing System (MLS) which is the new standard airport precision approach and landing system. The LORAN-C system will be expanded to fill the mid-continent gap. Visual landing aids will continue to be installed.

The following sections are contained in this chapter:

a. Navigation Aids

b. LORAN-C

c. Precision Approach and Landing Aids

d. Visual Landing Aids

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 8-1. The nomenclature used in the evolution diagram is explained in Appendix E. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. Navigation Aids

Description and Purpose

En route navigation coverage will be provided down to 2,000 feet above ground level (AGL) throughout the region except for areas of low traffic volume. The coverage will be provided by VOR/DME and VORTAC facilities.

Accomplishments (January 1, 1988-December 31, 1988)

1. The Regional VOR/DME/TACAN Network Plan was forwarded to AES-1 in 1987. But instead of being included in a National Network Plan, it was included in the NAS System Specification (NAS-SS-1000). The Regional Network Plan will continue to be reviewed and updated annually with changes submitted to update the NAS System Specification.

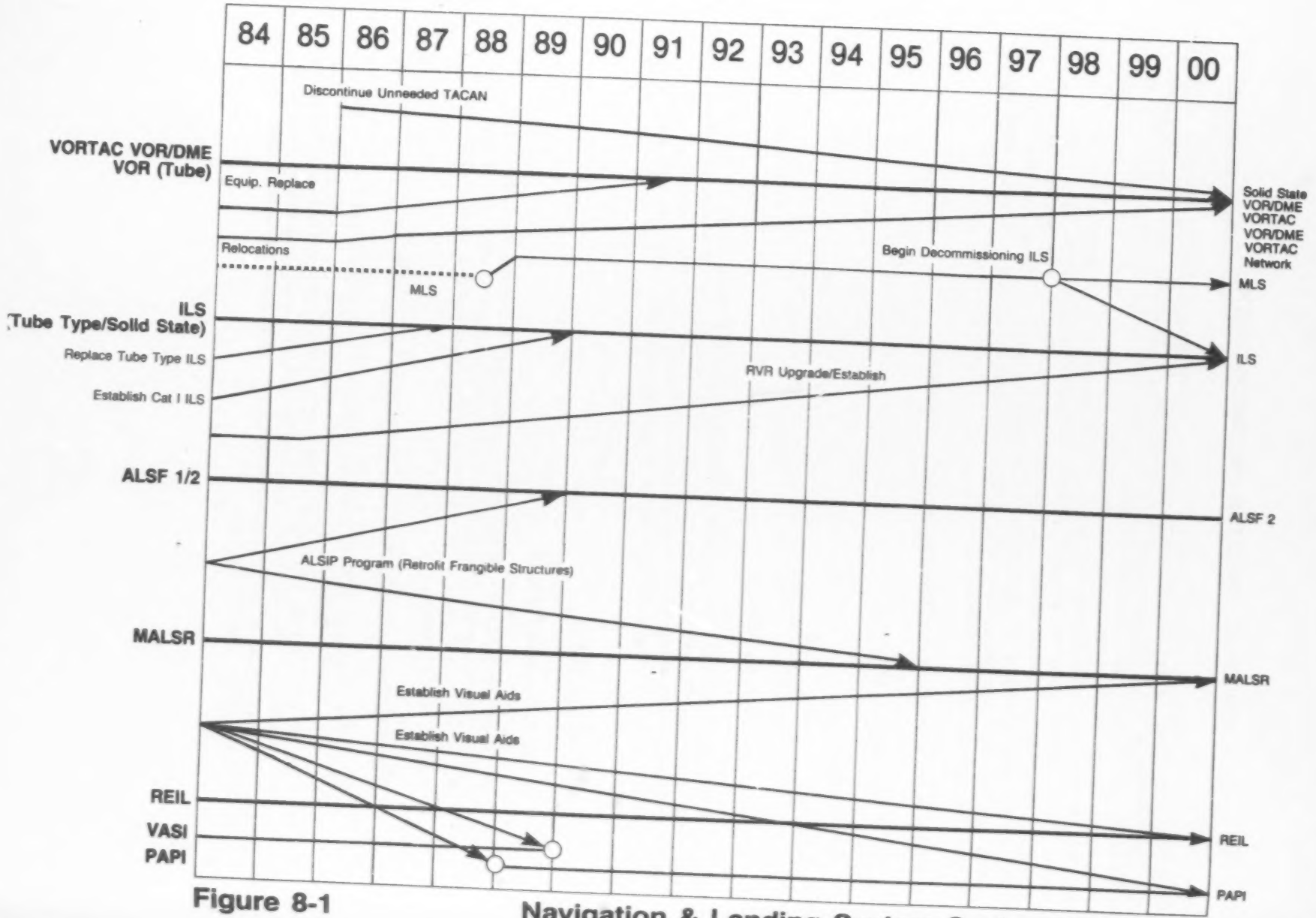


Figure 8-1 Navigation & Landing System Systems Evolution

2. The Detroit-Willow Run, Michigan (YIP) VOR/DME was removed from service in September, 1986 due to the interference from the relocated ATCT which was under construction at the time. This interference had been anticipated and the airport sponsor had been made aware of this possibility prior to the ATCT site selection. We are working with the sponsor to provide alternate standard instrument approach procedures (SIAP) into Willow Run Airport. We plan to relocate the VOR/DME to Detroit Metropolitan Airport in 1989 which may make a VOR procedure available to Willow Run Airport.

3. Second generation VOR equipment has been installed at the following rate during the first 5-1/2 years of the program:

CY	VOR INSTALLATIONS
83	35
84	85
85	24
86	3
87	1

Contractor-installed facilities were completed in January 1987.

Schedule of Events

1. In the Fall of 1988 the regional VOR/DME/TACAN Network Plan was revised. Regional implementation of the plan will continue with the circularization of all proposals to the public for comments prior to any final action.

2. Second/Next Generation VOR equipment will be installed in the Regions last seven (7) locations in 1991.

3. The commissioning plan for funded VOR/DME/TACAN facilities is updated monthly and published as a part of the report "Approximate Commissioning Dates for Principal F&E Projects for the Great Lakes Region". Please refer to the current version of that report for commissioning dates. For your convenience, the February 1988 version of that report is contained in Appendix B.

4. The status of proposed non-Federally owned and maintained VOR/DME facilities is contained in Appendix C.

Coordination

The lead office for the navigation systems network study is the Airway Facilities Division, Operations Engineering Branch, AGL-430, VOR Electronics Engineer, (312) 694-7376.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Navigation/Landing F&E Associate Program Manager, (312) 694-7593.

The lead office for the Second Generation VOR equipment replacement is the Airway Facilities Division, Program and Planning Branch, AGL-420, Navaids Associate Program Manager, (312) 694-7593.

The lead office for the non-Federally owned and maintained VOR/DME program is the Airway Facilities Division, Maintenance Engineering Branch, AGL-460, Non-Federal Navaids Coordinator, (312) 694-7328.

The lead office for Navigation and Landing Systems site selection is the Flight Standards Division, Flight Procedures Branch, AGL-220, (312) 694-7143.

Impact on Aviation Users

Increase reliability of ground based navigation aids.

Related Sections of Regional Plan

Remote Maintenance Monitoring System
Intrafacility Communications
Mass Weather Dissemination
Direction Finders (DF)
Modernization and Improvement of Unmanned FAA Buildings and Equipment

Related National Plans

National Airspace System Plan
National VOR/DME/TACAN Network Plan

b. LORAN - C

Description and Purpose

Starting in 1985, the FAA agreed to support a program to provide LORAN-C instrument approach procedures (there currently is a LORAN-C enroute navigation system) as a transition program between current

navigational aids and the future Global Positioning Satellite (GPS) system implementation. The "Early Implementation Program" required installation of 10 LORAN Monitor Receivers, designed to evaluate LORAN transmitter signal and assure safety when flying the LORAN-C non-precision instrument approach.

Accomplishments (January 1, 1988-December 31, 1988)

As previously reported, monitors required for the Early Implementation Program have been installed.

The Special LORAN-C instrument approach procedures for Columbus-Ohio State (OSU), Ohio, Kalamazoo, Michigan, Mansfield, Ohio, and Cincinnati Blue Ash, Ohio are developed and available for use by qualified operators.

The Early Implementation Program was due to end October 1, 1986, but was extended by the FAA Administrator until the follow-on LORAN-C instrument approach program is implemented.

Schedule of Events

Installation of approximately 196 additional monitor receivers (18 in this Region) are expected to be installed as part of an FAA contract in FY 1989/90. The monitors will be installed at selected existing FAA facility sites. With the installation of these monitors, a LORAN-C Standard Instrument Approach Procedure (SIAP) could be developed at qualified airports within 90 miles from the monitor.

Installation of 4 LORAN transmitter stations (1 in this region), used to close the "mid-continent gap", will be installed and operational by Spring 1991. With the installation of these stations, airborne receivers will require a "software change" in order to use the new transmitter signals.

FAA has published standards for the LORAN-C airborne equipment parameters. Standards are published in TSO (Technical Standard Order) C606.

Upon satisfactory completion of the LORAN-C non-precision instrument approach procedure evaluation, and the installation of required monitors, the FAA will process LORAN-C Standard Instrument Approach Procedures (SIAP) requests as currently outlined in the Great Lakes Region LORAN-C Standard Instrument Approach Procedure Implementation Plan.

Impact on Aviation Users

In order to use LORAN-C during this "Early Implementation Program", an operator must apply to a Flight Standards District Office for a

best copy available

Certificate of Authorization. An air carrier certificate holder must request a set of Special Operations Specifications.
Applicants must be prepared to present evidence that their installed LORAN-C equipment meets appropriate airworthiness standards, as described in Advisory Circular 20-121. Flightcrew members must have completed a training program that assures (1) competency in the special LORAN-C approaches, (2) an understanding of LORAN-C navigation principles, (3) knowledge of the specific operating techniques and procedures for the approach(es) to be used, (4) familiarity with the LORAN-C cycle slip, and with the limitations of the equipment and the contents of the Certificate of Authorization, or Operations Specifications.

Coordination

The lead office for LORAN-C is the Flight Standards Division, Flight Procedures Branch, AGL-220, (312) 694-7144.

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Navigation/Landing F&E Associate Program Manager, (312) 694-7593.

Related Sections of Regional Plan

None.

Related National Plans

National Airspace System Plan.

c. **Precision Approach and Landing Aids**

Description and Purpose

A precision approach can be conducted using the conventional Instrument Landing System (ILS) or the Microwave Landing System (MLS) in conjunction with other approach aids such as approach lighting systems (ALSF, SSALR or MALSR), runway visual range (RVR), and distance measuring equipment (DMEL/P). With a Category I precision landing system approach, minimums down to a 200-foot ceiling and one-half mile visibility are possible if no obstructions are present in the approach or missed approach surfaces.

Accomplishments (January 1, 1988-December 31, 1988)

1. Elements of the precision landing system were commissioned during this time period as shown below:

ILS	MLS	ALSF/MALSR	RVR	DMEL/P
2	-	1	-	2

2. A regional MLS Network Plan was written and released to the public in October 1985. This Plan specifies the locations and runways to be submitted for future F&E budget considerations. A total of 220 sites were identified. Due to the uncertainties in locations and funding in the FY-87/88/89 MLS appropriations, we were unable to update this plan in 1986, 1987 or 1988.

3. The total Standard Instrument Approach Procedures (SIAPs) which have been published and serve the flying public within the Great Lakes Region (as of December 31, 1988) are:

PRECISION APPROACHES	NON-PREC APPROACHES	TOTAL APPROACHES
193	1224	1417

Schedule of Events

1. The shutdown/commissioning plan for funded facilities is updated monthly and published as a part of the report, "Great Lakes Regional Shutdown Schedule". Please refer to the current version of that report for commissioning dates. For your convenience, the February 1989 version of that report is contained in Appendix B.

2. The status of proposed non-Federally owned and maintained MLS and ILS and non-directional beacon (NDB) facilities are contained in Appendix C.

3. During 1989, the regional MLS Network Plan will be revised to include any changes resulting from Congressional action on the MLS Program. The MLS plan will also be reviewed to identify what Airport Improvement Plan (AIP) projects are necessary to support the MLS Plan. Additionally, feasibility studies were conducted to determine if MLS could be used to establish a SIAP to Chicago-Midway (MDW) Airport, IL, Runway 22L and Cleveland-Burke Lakefront (BKL), OH, Runway 24R. The feasibility studies applied proposed TERPS criteria that are being considered for MLS use. Also, have been notified that Congress has mandated an ILS be established to serve Runway 22L at Chicago-Midway Airport. A MLS was site tested at Chicago Midway in August 1988. Results of the feasibility study and site test for Midway have concluded that an ILS is not possible because of frequency interference but that a MLS can be installed. A MLS is to be installed on Runway 22L at Midway as part of the MLS Demonstration Program in 1989.

4. All tube-type ILS equipment was converted to solid-state by CY-88, except for four unique localizer systems which are not scheduled for replacement. Tube-type RVR equipment cannot be replaced until 1991 due to equipment availability.

5. Existing airport approach lighting systems are proposed to be

modernized with frangible supports at the following rate:

FY	ALSF-2/SSALR	MALSR	TOTAL
89	2	2	4
90	1	3	4
91	-	5	5
92	2	2	4
93	2	2	4
94	3	4	7

Approximately 50 approach lighting systems (4 ALSF-2/SSALR, 40 MALSR) remain to be modernized with new electrical/electronic components on frangible supports as of December 31, 1988.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Navigation/Landing F&E Associate Program Manager, (312) 694-7593.

The lead office for the non-Federally owned and maintained ILS, MLS and NDB programs is the Airway Facilities Division, Maintenance Engineering Branch, AGL-460, Non-Federal Navaids Coordinator, (312) 694-7328.

The lead office for Navigation and Landing Systems site selection is the Flight Standards Division, Flight Procedures Branch, AGL-220, (312) 694-7143.

Impact on Aviation Users

MLS will be installed at new qualifying locations and collocated with existing ILS facilities. At locations with MLS and ILS facilities, including international airports, the ILS will operate until at least 1998.

Aircraft owners will be required to install MLS airborne equipment, which may cost from $2,000 to over $10,000 (commercial grade) to gain the benefits of the new system.

Related Sections of Regional Plan

None.

Related National Plans

National Airspace System Plan
National MLS Implementation Plan

d. **Visual Landing Aids**

Description and Purpose

Visual landing aids such as the Visual Approach Slope Indicator (VASI), Precision Approach Path Indicator (PAPI), and Runway End Identifier Light (REIL) systems assist pilots in making a visual approach to a runway. These systems enhance operational safety when making precision, non-precision, and VFR approaches.

Accomplishments (January 1, 1988-December 31, 1988)

Equipment deliveries for the FY-82 through FY-84 funded VASI projects began in September 1984, allowing these installations to begin early in FY-85. Landing aids were commissioned during CY-88 as shown below.

VASI	PAPI	REIL
7	--	8

Schedule of Events

1. The commissioning plan for funded VASI, PAPI, and REIL facilities is updated monthly and published as part of a report, "Great Lakes Regional Shutdown Schedule". Please refer to the current version of that report for commissioning dates. For your convenience, the February 1989 version of that report is contained in Appendix B.

2. VASI procurements and installations will be discontinued after CY-88 and PAPI procurements and installations will begin in CY-88. It is likely that installation of PAPI systems will begin before completion of all VASI system installations.

3. Landing aids are planned to be commissioned at the following rates:

CY	VASI	PAPI	REIL
89	--	10	5
90	--	10	5
91	--	7	4
92	--	10	5

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Navigation/Landing F&E Associate Program Manager, (312) 694-7593.

The lead office for site selection of these systems is the Flight

Standards Division, Flight Procedures Branch, AGL-220, Aviation Safety Specialist, (312) 694-7143.

Impact on Aviation Users

Enhance operational safety when making precision, non-precision, and VFR approaches.

Related Sections of Regional Plan

None.

Related National Plans

National Airspace System Plan

CHAPTER 9. SURVEILLANCE SYSTEMS

Surveillance of the airspace is currently provided by radar. There are two types: search (sometimes known as primary), which depends on signals reflected from aircraft or weather, and the radar beacon system (sometimes known as secondary radar), which receives reply signals transmitted from airborne electronic equipment. The en route system consists of long-range radars, Air Route Surveillance Radar (ARSR). The terminal system uses shorter range radar, Airport Surveillance Radar (ASR). Another type of radar, Airport Surface Detection Equipment (ASDE), is used by terminal controllers to detect aircraft and vehicles on the ground at airports. Another type of surveillance is the Direction Finder (DF) system, which is used to locate and guide aircraft that are lost or in other emergencies, via VHF radio transmissions from an aircraft, to determine its bearing on the ground. Improvements include networking of radar and DF systems for improved coverage, new Mode "S" beacon systems with data link capabilities, new solid-state ASR-9 terminal radars and relocation of ASR-7 and -8 solid-state radars to replace tube-type equipment, new three-dimensional long-range radars, and new solid-state ASDE and DF equipment.

The following sections are contained in this chapter:

a. Long-Range Radar

b. Terminal Radar

c. Mode "S"/Data Link

d. Airport Surface Detection Equipment

e. Direction Finder

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 9-1. The nomenclature used in the evolution diagram is explained in Appendix I. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. Long-Range Radar

Description and Purpose

Long-range radar facilities will be modified and consolidated to provide an efficient and effective national surveillance network.

Accomplishments (January 1, 1988-December 31, 1988)

The regional Surveillance Networking Plan has been updated, and engineering work is proceeding in accordance with that plan.

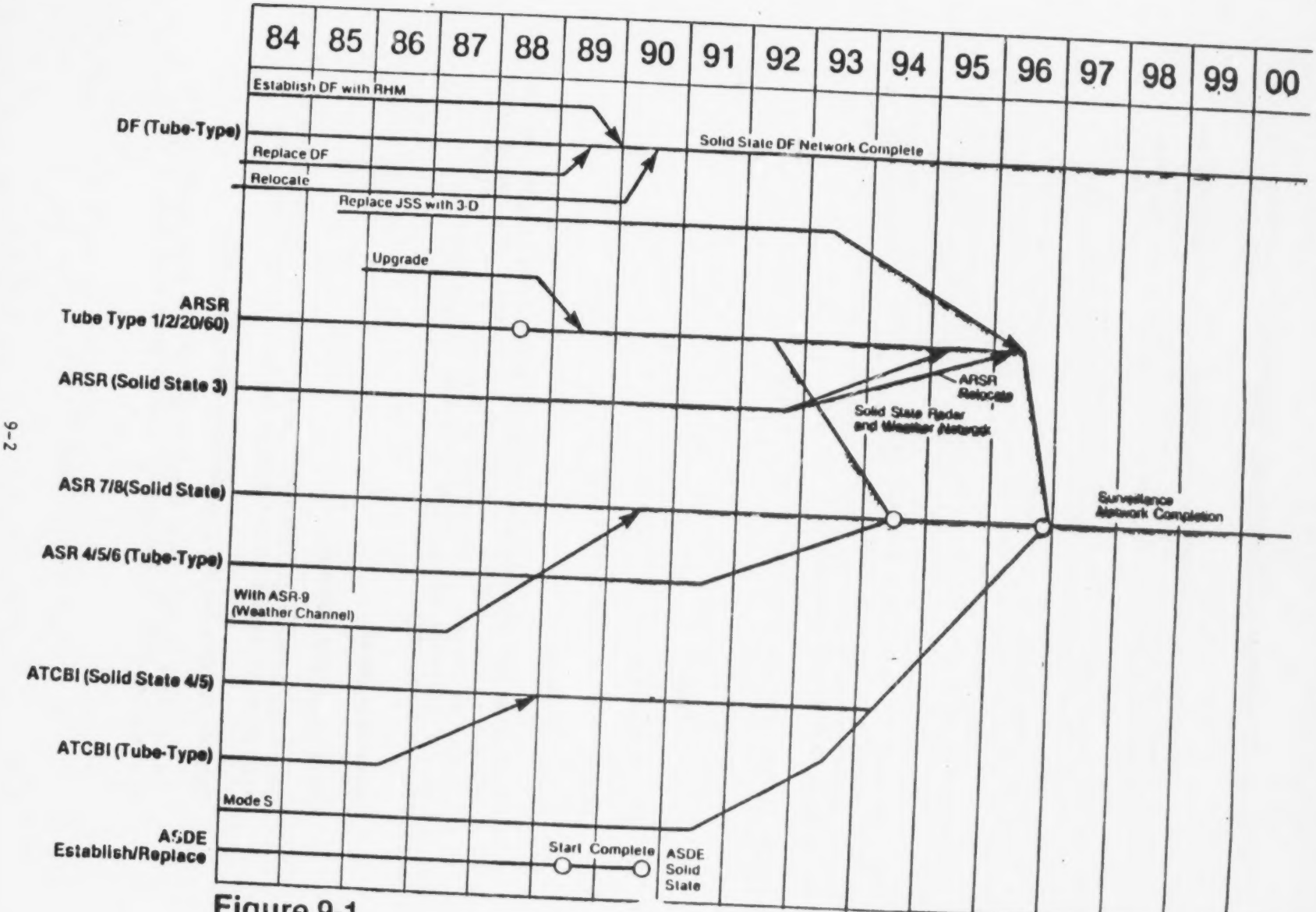


Figure 9-1

Surveillance Systems E...ution

Schedule of Events

1. Tube-type ARSR will be upgraded with solid-state equipment at the following rate:

FY	Rate
89	10

2. 3-D radars will be installed at joint FAA/USAF sites at the following rate:

FY	Rate
93	2
94	2

3. ARSR-3's will be relocated from joint FAA/USAF sites to replace the tube-type ARSR's at Tyler, Minnesota, and Apple Valley, Minnesota, and to establish a new central Wisconsin site during the FY-94 - FY-95 time frame.

4. Beacon only systems will be established at Port Austin and Calumet, Michigan. Equipment for these will be provided for in the second contract purchase of MODE-S equipment, to be fielded in 1993 - 1994.

5. Decommissioning Eagle River, Wisconsin, beacon-only site after Calumet (Beacon Only) and Central, Wisconsin ARSR-3 are established.

6. Decommission the Huntingburg, Indiana Beacon only facility in FY-95.

7. To improve the enroute radar coverage in the Chicago area, an FPS Radar is being established at Coopersville, Michigan and the existing McCook ARSR-3 will be relocated to Joliet, Illionois.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch, is AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586, with close coordination required with the Air Traffic Division.

The Airway Facilities Division, Operations Engineering Branch, AGL-430, (312) 694-7441, is responsible for the Surveillance Networking Plan.

Related Sections of Regional Plan

AAS, Mode "S"/Data Link, Long-Range Radar, ACF, Interfacility Communications, RMM

Related National Plans

National Airspace System Plan
NAS-SS-1000

b. **Airport Surveillance Radar (ASR)**

Description and Purpose

ASR-9 radars will be installed at high traffic volume airports in the Region. Existing ASR-7 and -8 radars at these sites will be relocated ("leapfrogged") to other airports replacing older tube-type ASR's.

Accomplishments (January 1, 1988-December 31, 1988)

Engineering was completed for the first two delivery sites (Toledo and Madison) in CY 1988. Construction for those sites, and engineering and construction for an additional five sites, will be completed in CY 1989.

The first system has been delivered to Huntsville, Alabama for testing, and was commissioned on March 31, 1989.

Schedule of Events

1. The commissioning plan for funded ASR facilities is updated monthly and published as a report, "Approximate Commissioning Dates for Principal F&E projects for the Great Lakes Region". Please refer to the current version of that report for commissioning dates, contained in Appendix B.

2. The following locations will receive ASR-9's between late 1989 and late 1991:

*Toledo, OH	Minneapolis, MN
Chicago O'Hare, IL	*Indianapolis, IN
Chicago South, IL	*Columbus, OH
*Detroit, MI	*Milwaukee, WI
*Cleveland, OH	Dayton, OH
*Madison, WI	Grand Rapids, MI
	Ft. Wayne, IN

3. The following locations will receive leapfrog ASR-7/8 radars from sites receiving the ASR-9 radar:

Mansfield, OH	Evansville, IN
Terre Haute, IN	Rockford, IL
Muskegon, WI	Kalamazoo, MI
Champaign, IL	Saginaw, MI
Duluth, MN	

Engineering and equipment installation will be accomplished by the Technical Support Services Contractor (TSSC).
* Change in site location on the airport planned.

Impact on Aviation Users

This project is being undertaken solely to improve the operational efficiency of the FAA.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586.

Related Sections of Regional Plan

Mode "S"/Data Link, ACF, RMM

Related National Plans

National Airspace System Plan
NAS-SS-100

c. **Mode "S"/Data Link**

Description and Purpose

Mode "S" will replace the secondary radar system with a system that provides two-way communications with the aircraft. Weather, separation, air traffic control clearance, etc., will be given to the pilot without controller intervention. Full data link services will include data and function which will be available from the advanced automation system. (See Appendix B for Mode S schedules.)

Accomplishments (January 1, 1988-December 31, 1988)

Production and testing of first systems has begun by Westinghouse, the Mode S turnkey contractor.

Schedule of Events

Mode "S" will be installed at the following 17 Great Lakes Region sites from mid 1991 through 1993:

Bismarck, ND
Chicago (O'Hare), IL
Chicago (Tinley Pk), IL
Detroit, MI
Cleveland, OH
Minneapolis, MN
Indianapolis, IN
Columbus, OH
Milwaukee, WI
Dayton, Ohio
Grand Rapids, MI
Fargo, ND
Green Bay, WI
Evansville, IN
Duluth, MN
Tyler, MN
Gettysburg, SD

Impact on Aviation Users

Weather, separation, ATC clearance, etc., will be given to the pilot without controller intervention.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586, with close coordination with the Air Traffic Division.

Related Sections of Regional Plan

Long-Range Radar, Terminal Radar, ACF, RMM, CWP

Related National Plans

National Airspace System Plan

d. **Airport Surface Detection Equipment (ASDE-3) Radar**

Description and Purpose

At high-activity airports, radar monitoring of airport operations (ground movements by aircraft and other supporting vehicles) is required to maintain aircraft separation and provide an effective and expeditious means of directing and moving surface traffic. This is especially important during periods of low visibility such as rain, fog, snow, and night operations.

Accomplishments (January 1, 1988-December 31, 1988)

Critical design review (COR) and first system production have been accomplished. Testing of the first system (at Republic Airport, NY) is ongoing.

Schedule of Events

A specification has been developed which details a ground surveillance radar that will map the airport complex and identify airplane or service equipment locations and movement. A national contract was awarded in September 1985.

Deliveries for this region are planned starting in calendar year 1991 with the last system delivery in 1993. Current regional requirements are to replace two existing systems and to establish two new systems. The schedule is as follows:

Chicago O'Hare	Replace	2/91
Cleveland Hopkins	Replace	11/91
Minneapolis	Establish	11/91
Detroit	Establish	11/91

Norden Systems has begun production of ASDE-3 equipment, and is in validation testing of software.

Impact on Aviation Users

More efficient movement and separation of ground traffic at airports.

Coordination Required

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586, with close coordination with Air Traffic Division.

Related Sections of Regional Plan

None

Related Project in National Plans

NAS Plan

e. **Direction Finders** (D.F.)

Description and Purpose

The Direction Finder System consists of a receiver antenna and a monitor located at an Automated Flight Service Station (AFSS). The system is used in emergencies to locate and give directions to lost aircraft, along major VFR flyways and in non-radar areas, down to 2,000' AGL. The equipment is monitored and operated by Air Traffic Control personnel from the AFSS.

Accomplishments (January 1, 1988-December 31, 1988)

Engineering has been completed for the first four regional DF replacement projects. DF installation at these four sites will take place in CY 1990.

Schedule of Events

1. A current national contract will provide 62 VHF-DF systems with remote maintenance monitoring (RMM) capabilities. The Great Lakes Region will receive nine systems, one for each AFSS. The antennas will replace vacuum tube (type 5530) equipment.

2. A future contract will provide additional solid state antenna equipment to further replace vacuum tube type equipment. These antennas will be removed to the previously installed solid state monitor equipment at the AFSS.

3. Another future contract will provide RMM capabilities to existing solid state (type 9964) DFs.

Impact on Aviation Users

Upgrading to solid state equipment will improve system reliability and decrease maintenance costs by providing RMM capabilities.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-422, Surveillance F&E Associate Program Manager, 312/694-7586.

Related Sections of Regional Plan

RMM, AFSS, Interfacility Communications, Navigational Aids.

Related National Plans

National Airspace System Plan
National DF Networking Plan

CHAPTER 10. WEATHER SYSTEMS

Weather systems provide weather information to pilots, controllers, flight service specialists, and meteorologists. New or improved systems will be installed for the detection, collection, and dissemination of better quality and more current weather information. Networking techniques will be employed to determine site locations for new surveillance systems such as Automated Weather Observation (AWOS) and Weather Radars in a cooperative effort with the National Weather Service, Department of Defense, and airport sponsors. Other projects will provide for improved processing and dissemination of the weather data.

The following sections are contained in this chapter:

a. Central Weather Processor

b. Mass Weather Dissemination

c. Low-Level Wind Shear Alert System

d. Weather Surveillance

The evolution diagram for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 10-1. The nomenclature used in the evolution diagram is explained in Appendix E. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

The Airway Facilities Division, Operations Engineering Branch, AGL-430, (312) 694-7496, is responsible for developing an Aviation Weather Plan for the Region. The Plan will integrate these weather components into an effective system for use by the FAA, NWS, DOD, and the flying public.

a. Central Weather Processor

Description/Purpose

The central weather processor (CWP) at air route traffic control centers will distribute current weather radar information to flight service specialists and center meteorologists. The central weather processor will provide automated distribution of alphanumeric and graphic weather information to operating positions in flight service stations, via the flight service data processing system. (FSDPS).

Accomplishments (January 1, 1988-December 31, 1988)

None.

Schedule of Events

CWP equipment will be provided to all ACF's in 1992 to 1993.

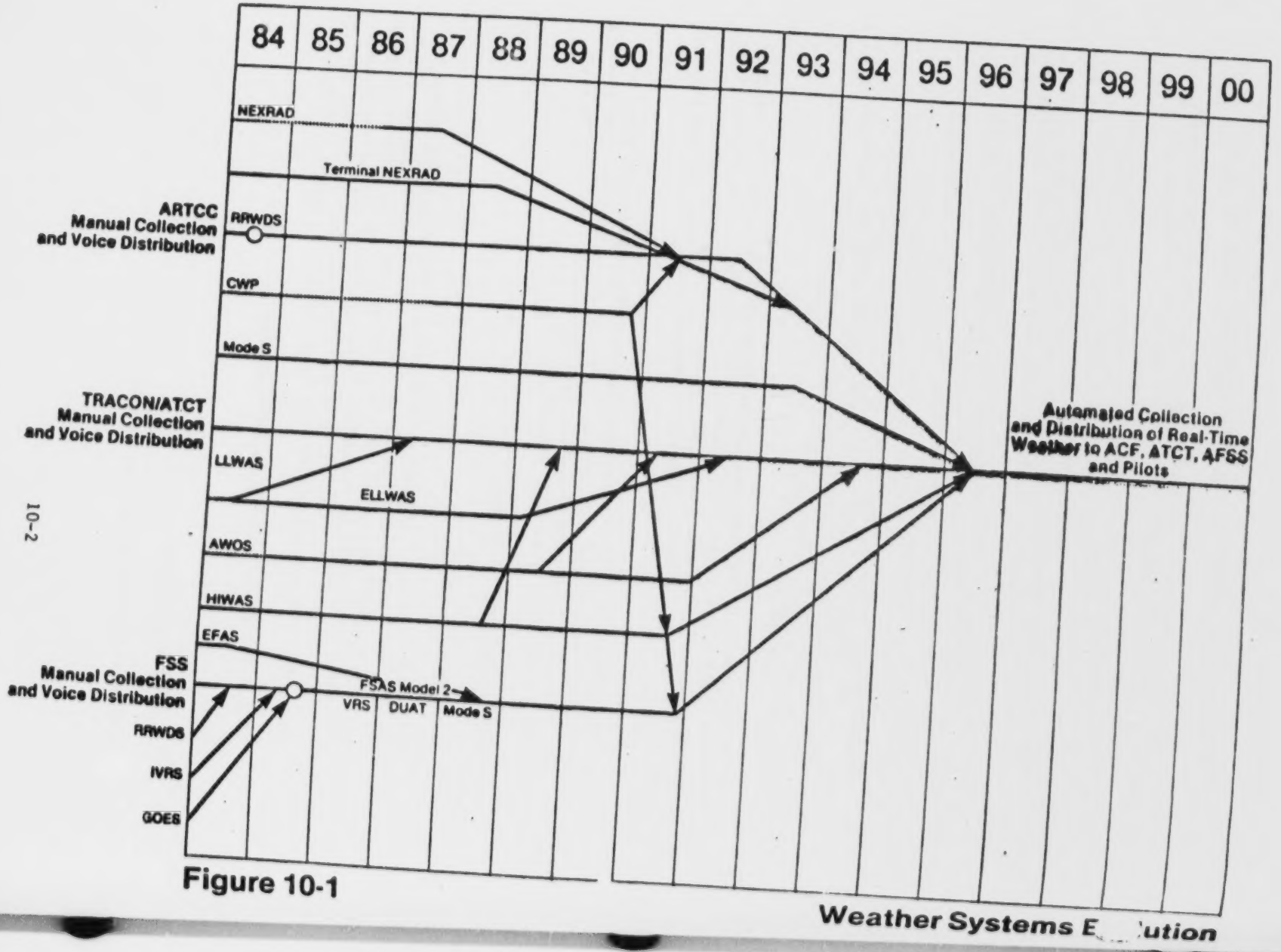

84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
00
NEXRAD
Terminal NEXRAD
ARTCC
Manual Collection
and Voice Distribution
RRWDS
CWP
Mode S
TRACON/ATCT
Manual Collection
and Voice Distribution
LLWAS
ELLWAS
AWOS
HIWAS
EFAS
FSS
Manual Collection
and Voice Distribution
FSAS Model 2
VRS
DUAT
Mode S
RRWDS
IVRS
GOES
Automated Collection
and Distribution of Real-Time
Weather to ACF, ATCT, AFSS
and Pilots
Weather Systems Evolution

Figure 10-1

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch, is AGL-421, Enroute F&E Associate Program Manager, (312) 694-7422.

Impact on Aviation Users

The Central Weather Processor Program is aimed at reducing the high percentage of weather related accidents and air traffic delays.

Related Sections of Regional Plan

AAS, Weather Surveillance, FSDPS

Related National Plans

National Airspace System Plan
Aviation Weather System Plan

b. Mass Weather Dissemination

Description and Purpose

Aviation weather data will be disseminated to pilots through the following systems:

Interim Voice Response System (IVRS) - a self-briefing system that will permit pilots to retrieve information directly from an automated weather base by telephone.

En route Flight Advisory Service (EFAS) - a system to provide en route aircraft with timely and meaningful weather advisories pertinent to the type of flight intended, route of flight and altitude.

Hazardous Inflight Weather Advisory Service (HIWAS) - a system to provide continuous prerecorded broadcasts to weather advisories over selected VOR frequency at and above 4,000 feet above ground level.

Accomplishments (January 1, 1988-December 31, 1988)

None

Schedule of Events

National contract for HIWAS equipment has been awarded. HIWAS and ATIS recorders are being procured under the same contract; equipment to be delivered to depot by mid-summer of 1989.

Equipment is a single channel digital recorder and will be mounted on existing racks inside all FSS's/AFSS's; data will be fed over existing telephone lines to selected VOR sites and to pilots over selected VOR frequency.

Each FSS/AFSS is to receive two HIWAS recorders plus an interface Panel (one recorder to be used as a backup while the interface panel allows switching between recorder). Interface panels are also being procured by Headquarters.

HIWAS recorders and interface panel will be available from depot by mid-summer of 1989 and regions are required to order systems from depot when sites are ready.

Coordination

The lead office for Airway Facilities Division is AGL-451, Terminal Enroute Engineering Section, (312) 694-7663. Program responsibility is AGL-420 (312) 694-7423.

Impact on Aviation Users

Direct access to weather data via touch-tone phone.

Increased availability of EFAS data.

Increased availability of HIWAS data.

Related Sections of Regional Plan

AFSS, IVRS, Navigation Aids

Related National Plans

National Airspace System Plan
Aviation Weather System Plan

c. **Low-Level Wind Shear Alert System (LLWAS)**

Description/Purpose

These systems will provide the controller with information to alert pilots on hazardous wind conditions (on or near airports) that may create unsafe conditions for aircraft landings or departures.

Accomplishments (January 1, 1988-December 31, 1988)

Implementation will be accomplished in three major phases.

Phase I Basic LLWAS, six-sensor configuration.

All 18 airports in the Great Lakes Region are completed (O'Hare, Detroit, Indianapolis, Cleveland, Columbus, Dayton, Milwaukee, Moline, Peoria, Springfield, Grand Rapids, Lansing, Rochester, Toledo, Sioux Falls, Green Bay, Minneapolis and Madison).

Phase II Six-sensor improvement includes a new computer (faster with more storage, improved microburst algorithum, and new circuit boards at the remote sites).

Detroit Metro	Completed May 9, 1988
O'Hare	Completed May 23, 1988
Indianapolis	Completed June 13, 1988
Minneapolis	Completed August 12, 1988
Milwaukee	Completed August 26, 1988
Cleveland	Completed August 31, 1988
Columbus	Completed October 3, 1988
Dayton	Completed December 16, 1988

Remaining 10 airports - scheduled date for completion not determined.

Phase IIIA Six-sensor optimization deals with adding new CRT displays and improved siting of the existing six-sensor by eliminating sheltering effects. (New sites and taller poles for anemometers where needed).

Detroit and O'Hare are scheduled for completion late fall of 1989.

Remaining 16 airports - scheduled date for completion not determined.

Phase IIIB Network expansion deals with expansion of the LLWAS by increasing the number of wind sensors at each airport.

Detroit and O'Hare are scheduled for completion mid-summer of 1990. Fourteen additional sensors are planned for O'Hare. Ten additional sensors are planned for Detroit.

Coordination

The lead office for Airway Facilities Division, is the Program and Planning Branch, AGL-420, (312) 694-7423.

Impact on Aviation Users

Increased safety for flying public when conducting operations in adverse weather conditions.

Related Sections of Regional Plan

None.

Related National Plans

NAS Plan
Aviation Weather System Plan

d. **Weather Surveillance**

Description and Purpose

Weather surveillance will be enhanced by the following programs:

Automated Weather Observation Systems (AWOS)/(ASOS) - a joint FAA-NWS-Airport sponsor effort to collect weather data by remote monitors at selected airports that do not have NWS weather observers.

Radar Remote Weather Display System (RRWDS) - a system to provide real-time weather and intensity levels to the Center Weather Service Units at centers and FSS EFAS locations.

Next Generation Weather Radar (NEXRAD, Terminal NEXRAD, and Terminal Doppler Weather Radar) - these programs will provide Doppler weather data to center weather unit meteorologists, center and terminal controllers, FSS specialists, and pilots.

Accomplishments (January 1, 1988-December 31, 1988)

1. AWOS - Under the first buy, the FAA plans to procure a total of 160 commercially available AWOS III systems. The FAA plans to have a contract award for AWOS III systems by June 1988 with the first Operational Readiness Date (ORD) being May 1989; last ORD being May 1991.

2. ASOS - Under the second buy, the National Weather Service (NWS) has signed an agreement with the FAA to take over the procurement of AWOS program. The NWS Automated Surface Observing System (ASOS) will be used in place of the AWOS III systems. The NWS plans to have a contract award for ASOS system by June 1990 with the first ORD being September 1991; last ORD being September 1994.

3. AWOS - The first buy of AWOS III systems will be installed at selected non-towered locations having precision landing aids with Phase II benefit/cost ratio greater than one, and having no current source of weather reporting stations that operates 16 hours per day or more within 10 nautical miles of the airport or having extraordinary circumstances, which makes it a logical AWOS site. The Great Lakes region has submitted 64 place name locations which will be eligible to receive an AWOS III or ASOS system under the first or second buys. This listing of 64 non-towered locations is shown on page 10-8.

4. NEXRAD and Terminal NEXRAD - A contract was awarded to UNISYS Corporation for production and installation of 178 NEXRAD systems. The National Weather service will assume maintenance responsibilities for the majority of these systems. Seventeen systems have been designated for modification and installation as Terminal NEXRAD's for use by FAA. NEXRAD installations will take place between 1990 and 1994.

5. Terminal Doppler Weather Radar (TDWR) - A contract was awarded to Raytheon Corporation for production and installation of TDWR systems at high activity airports throughout the country. Fifteen TDWR's are planned for installation in the Great Lakes Region between 1992 and 1995.

Schedule of Events

1. Under the first buy our region is scheduled to receive 21 non-towered AWOS III systems and 6 FSS AWOS III systems. Place name locations along with planned installation dates are shown on page 10-8.

2. Under the second buy the remaining non-towered, towered, and FSS locations will be considered for a NWS ASOS system. Planned installation dates are not known at this time.

Coordination

The lead office for the AWOS Program is the Airway Facilities Division, AGL-452, NAVAIDS Engineering Section (312) 694-7461. The lead office for AWOS site selection is the Flight Standards Division, Flight Procedures Branch, AGL-220, (312) 694-7143. Program responsibility is AGL-420 (312) 694-7423. The lead office for NEXRAD and TDWR is the Airway Facilities Division, Program and Planning Branch, AGL-422, Surveillance F&E Associate Program Manager, (312) 694-7586.

Impact on Aviation Users

AWOS will facilitate the acquisition of current weather information and may lower instrument approach minimums at some locations.

RRWDS will provide better weather information to pilots and controllers.

NEXRAD and Terminal NEXRAD will provide improved (more timely and accurate) hazardous weather detection and warnings for air traffic control and advisory applications.

Related Section of Regional Plan

CWP, Navigation Aids, FSDPS, Mode S/date Link, Interfacility Communications, AFSS, AAS, ACF

Related National Plans

National Airspace System Plan
Aviation Weather System Plan

(NON-TOWER)
64-TENTATIVE AWOS LOCATIONS
[City (Airport Identifier)]

ILLINOIS	CAI PLANNED DATE
LAKE-IN-THE-HILL (3CK)	
LAWRENCEVILLE (LWV)	
MATTOON-CHARLESTON (MTO)	
*MT. VERNON (MVN)	7/15/89
ROMEOVILLE (LOT)	
*STERLING/ROCK FALLS (SQI)	7/15/89
WAUKEGAN (UGN)	
WILLIAMSON CO-MARION (MWA)	

INDIANA	
GOSHEN (GSH)	
INDPLS/EAGLE CREEK (I14)	
*KOKOMO (OKK)	9/15/89
SHELBYVILLE (3SM)	
VALPARAISO (VPZ)	

MICHIGAN	
ADRIAN (ADG)	
BENTON HARBOR (BEH)	
*ESCANABA/DELTA (ESC)	5/31/90
GAYLORD (GLR)	
HANCOCK/HOUGHTON (CMX)	
HOLLAND (C19)	
IRON MOUNTAIN (IMT)	
*IRONWOOD (IWD)	5/31/90
*MANISTEE/BLACKER (MBL)	6/15/90
*MENOMINEE (MNM)	10/15/90
*SAULT ST. MARIE (CIU)	5/31/90

MINNESOTA	
BAUDETTE (BDE)	
*BEMIDJI (BJI)	6/30/90
BRAINERD (BRD)	
*FAIRMONT (FRM)	9/30/90
*GRAND RAPIDS (GPZ)	6/30/90
*MANKATO (MKT)	9/30/90
*MARSHALL (MML)	10/15/90
PARK RAPIDS (PKD)	
*THIEF RIVER FALLS (TVF)	6/30/90
*WORTHINGTON (OTG)	10/15/90

NORTH DAKOTA	CAI PLANNED DATE
*DEVILS LAKE (DVL)	5/15/89

SOUTH DAKOTA	
*BROOKINGS (BKX)	10/31/90
*MITCHELL (MHE)	10/31/90
*YANKTON (YKN)	10/31/90

OHIO	
ASHTABULA (7G2)	
DAYTON (MGY)	
DEFIANCE (DFI)	
FREMONT (14G)	
HAMILTON (HAO)	
KENT (1G3)	
LANCASTER (I15)	
LIMA (AOH)	
LORAIN/ELYRIA (22G)	
MARION (MNN)	
NEW PHILADELPHIA (PHD)	
NEWARK (2I8)	
TOLEDO (TDZ)	
WOOSTER (BJJ)	

WISCONSIN	
ASHLAND (ASX)	
BOSCOBEL (47C)	
FOND DU LAC (FLD)	
HAYWARD (HYR)	
KENOSHA (ENW)	
*MANITOWOC (MTW)	10/15/90
MARSHFIELD (MFI)	
RACINE (RAC)	
RHINELANDER (RHI)	
SHEBOYGAN (SBM)	
*STURGEON BAY (SUE)	10/15/90
WISCONSIN RAPIDS (ISW)	

*Under the 1st buy with planned installation dates as shown

(Flight Service Station)
6-TENTATIVE FSS LOCATIONS

LOCATION	CAI PLANNED DATE
*Quincy, IL FSS	9-15-89
*Marquette, MT FSS	5-31-90
*Hibbing/Wash, MN FSS	6-30-90
*Dickinson, ND FSS	5-15-90
*Findlay, OH FSS	9-15-89
*Eau Claire, WI FSS	10-31-90

*Under the 1st buy with planned installation date

CHAPTER 11. MAINTENANCE AND OPERATIONS SUPPORT SYSTEMS

Maintenance and operations support systems are required elements to generally support the National Airspace System described in preceding chapters. The agency and this Region are in the early stages of a major program (Maintenance Program for the 1980's) to reduce the cost of maintenance support. This Program is centered around the replacement of maintenance intensive equipment with solid-state as described in preceding chapters and introduction of Remote Maintenance Monitoring Systems. It will allow reductions and consolidations of personnel and field maintenance facilities without degradation of service. Also included are modernization of facility buildings and equipment to realize energy savings and modernization of airport cable systems for increased reliability and reduction of maintenance.

The following sections are contained in this chapter:

a. Remote Maintenance Monitoring System
b. Modernize Airport Cables into Loop Systems
c. Modernize and Improve Unmanned FAA Airway Facilities Buildings and Equipment and Power Systems

The evolution diagrams for the programs contained within this chapter (as they pertain to the Great Lakes Region) is shown in Figure 11-1. The nomenclature used in the evolution diagram is explained in Appendix I. For further discussion of the rationale behind these programs, please refer to the National Airspace System Plan.

a. Remote Maintenance Monitoring System

Description and Purpose

The Remote Maintenance Monitoring System (RMMS) will use state-of-the-art automated equipment for remote monitoring, maintenance, certification, and control of FAA facilities and equipment from centralized locations. The goal of RMMS is to provide some of the functions required for implementation of the 80's Maintenance Concept. The functions to be supplied by the RMMS have been identified to be:

1. Facilities and Alarm
2. Certification
3. Remote Control of Equipment
4. Automatic Record Keeping and Information Retrieval
5. Performance Trend Analysis
6. Remote Diagnostics and Fault Isolation
7. Uplink Equipment Adjustment
8. Failure Anticipation
9. Problem/Solution File
10. System Security

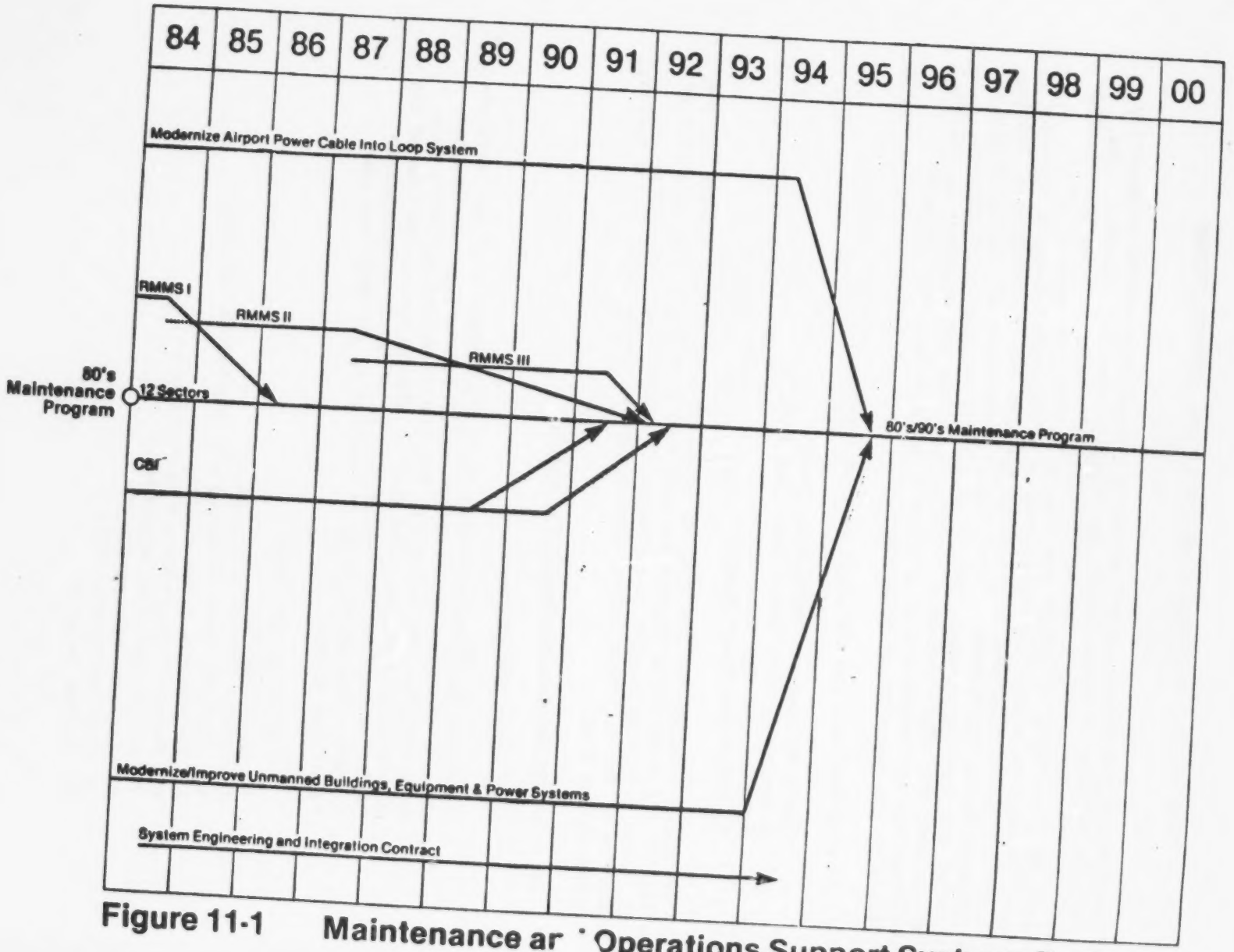


Figure 11-1 Maintenance ar Operations Support Systems Evo ion

RMMS, in conjunction with solid-state equipment replacement, facility consolidation, and a revised maintenance philosophy, is expected to provide better reliability and reduced operations and maintenance costs.

As shown in figure 11a-1, Remote Maintenance Monitoring System Architecture, the RMMS will include various types of hardware, including remote monitoring subsystem concentrators (RMSC), remote monitoring subsystem (RMS), and maintenance processor system (MPS). An interface will exist to all RMM'ed equipment in the NAS, with the interconnections being made via the Interfacility Communication Network. Access to the RMMS will be via terminals, both fixed and portable.

Accomplishments (January 1, 1988-December 31, 1988)

1. The ARMS installation for the region was reviewed and verified for location. Installation planned October 1989 through October 1990.

Schedule of Events

Complete implementation of Phase I Maintenance Management System (MMS) and Initial Maintenance Control System (IMCS) at existing MPS locations during CY87.

Phase II

1. Install ARSR-3 full RMM starting April 1987.

2. Install Navigation Aids RMM beginning October 1989.

3. Install Communication Aids RMM beginning September 1987. (RCAG, RTR, RCO, etc., included in RCE Program)

Phase III

Phase III will consist of enhancements of the RMMS such as adding uplink adjustment capabilities, remote diagnostics, and other features geared to reduce the frequency of on site maintenance visits in consonance with the Maintenance 80's Concept. These enhancements will be handled concurrently with Phase II and during the acquisition and integration of new equipments for the NAS.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Flight Service F&E Associate Program Manager, (312) 694-7591. Frequent coordination will be required with the NAS Program Management and Evaluation Staff, AGL-403.

Impact on Aviation Users

Improved system reliability, monitoring, restoration, and facility status reporting.

Related Sections of Regional Plans

Interfacility Communications
Area Control Facilities
Advance Automation System
Central Weather Processor
Automated Flight Service Stations
Maintenance Management System

Related National Plans

National Airspace System Plan
Maintenance 80's Plan
Information Resources Management Plan
Level I/II Design Documents

b. **Modernize Airport Cables into Loop System**

Description/Purpose

This program calls for the replacement of the deteriorating cables at major hub airports. In addition to the cable replacement with a loop-type system, a cable master plan for each hub airport will be developed. Small airport telecommunications systems will also be developed under this program.

Accomplishments (January 1, 1988-December 31, 1988)

None.

Schedule of Events

1. Master plans will be developed for 25 Activity Level (III, IV & V) Airports being in 1987 through 2000.

   (a) Chicago O'Hare is the First Airport (Level V) in our region to begin replacing deteriorating control/signal cables with a fiber optic cable loop system. This work is scheduled to begin late summer of 1988 with expected completion date mid-1990.

(b) Detroit Metro is the second airport (Level V) in our region to begin replacing deteriorating control/signal cables with a fiber optic cable loop system. This work is scheduled to begin in mid-1989, completion date has not been determined. A partial fiber optic cable is in operation.

(c) Indianapolis is the third airport (Level IV) in our region to begin replacing deteriorating control/signal cables with a fiber optic cable loop system. This work will be accomplish along with the planned airport development. (Addition of a new parallel Runway 4L/22R, relocation of RTR-U, RTR-I, VOR facilities and a new ASR site). The airport development work has begun in late 1987, the fiber optic cable loop work will begin in late 1988, completion date has not been determined.

Coordination

The lead office for Airway Facilities Division, Program and Planning Branch is AGL-421, Weather & Auxiliary F&E Associate Program Manager, (312) 694-7588.

Impact on Aviation Users

None. This project is being undertaken solely to improve the operational efficiency of the FAA.

Related Sections of Regional Plan

All projects on airports
Ground-to-air Communications
Interfacility Communications
Intrafacility Communications
RMM

Related National Plans

National Airspace System Plan
Maintenance 80's Plan

c. **Modernize and Improve Unmanned FAA Airway Facilities Buildings and Equipment and Power Systems**

Description and Purpose

This continuing and ongoing program provides the required modernization and improvement projects for the many existing navigation aids, radars, and communication Airway Facilities buildings that will be needed in their present location for the next 20 years.

Interface with the Remote Maintenance Monitoring System (RMMS)

EMPS — Enroute Maintenance Processor Subsystem
MCC — Maintenance Control Center
MM — Maintenance Monitor
RMS — Remote Monitoring Subsystem
RMSC — Remote Monitoring Subsystem Concentrator
SI — Sensor Interface
SMPS — Sector Maintenance Processor Subsystem
WC — Work Center
(ICD) — Interface per Interface Control Document

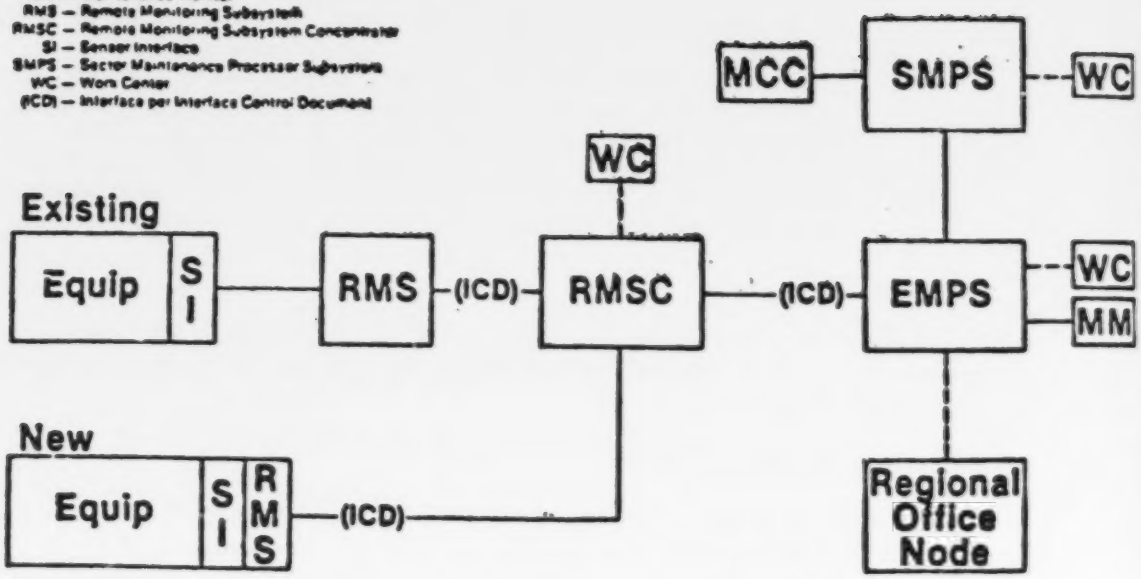


Figure 11a-1

Modernize and improve projects include, but are not limited to, reroofing, installation of insulated siding, correction of OSHA violations, lightning and surge protection, heating/ventilation/air-conditioning (HVAC) system, and HVAC environmental control replacement, etc.

Accomplishments (January 1, 1988-December 31, 1988)

The Great Lakes Region has 157 VOR facilities which will require upgrading. Upgrading of these facilities will consist of the following:

Reroofing	Of the 157 VOR facilities, 36 are in good shape, 21 have been reroofed with 16 more scheduled for completion in FY-89.
HVAC	HVAC equipment and environmental controls have been provided for all 157 VOR facilities.
Electrical	Upgrade of the electrical distribution for all 157 VOR facilities has not been completed, to date only 47 facilities have been upgraded.

Schedule of Events

Facilities will be modernized at the following rates:

FY	Rate	Description
89	16	VOR/VORTAC (planned for)
88	8	VOR/VORTAC (completed)

Coordination

The lead office for Airway Facilities Division is AGL-430, Operators Engineering Branch, (312) 694-7441. Program responsibility is AGL-420 (312) 694-7588.

Impact on Aviation Users

None.

Related Sections of Regional Plan

Navigation Aids
Precision Approach and Landing Aids
Visual Loop Cabling

Ground-to-air Communications
Terminal Radar
Direction Finder
Airport Loop Cabling

Related National Plans

NAS Plan
Maintenance 80's Plan

CHAPTER 12. INFORMATION RESOURCES MANAGEMENT

a. Regional Implementation of Agency IRMP Projects

Description and Purpose

The Information Resources Management Plan (IRMP) defines future agency information requirements and provides a development and implementation schedule to achieve the identified requirements. The Plan is composed of 13 functional areas of information and establishes 73 specific data processing projects. For descriptions and implementation schedules, the reader is referred to the IRMP, Volumes I and II, published in December 1987.

Accomplishments During the Period January 1, 1988 - December 31, 1988

1. Automated Operations Specifications and Vital Information Subsystem was installed in May 1988, AGL-200.

2. Maximum/Minimum Equipment List System was installed in June 1988, AGL-200.

3. The Airport Grants Tracking System was installed in April 1988, AGL-600.

4. A microprocessor-based system that updates the National Plan of Integrated Airport Systems (NPIAS) by the ADO's/AFO's was installed in October 1988, AGL-600.

5. The Supervisory Identification and Development Program System (SIDP) was installed in September 1988, AGL-10.

6. The Modular Applicant Tracking and Examining System (MATES) which scores air traffic controller entrance examinations at the testing site was installed in the 2nd quarter 1988, AGL-10.

7. The Personnel Reporting System was installed in October 1988, AGL-10.

8. The Pre-Employment Tracking System (PETS) which links several division's respective pre-employment processing activities was installed in February 1988.

9. The following subsystems of the Civil Aviation Security Information System (CASIS) were installed in 1988, AGL-700:

    a. Inspection System, June 1988.
    b. Hazardous Material System, October 1988.
    c. Contingency System, October 1988.

10. A microprocessor - based network providing word processing and data base and consisting of one file server and sixty-five work stations was installed in the Logistics Division in December 1988, AGL-50.

11. Automated logging and workload scheduling was implemented at the AGL ARTCC's under MMS Phase I in mid-1988, AGL-400.

SCHEDULE OF EVENTS

1. Re-hosting of the Burroughs configurations in Flight Standards staff and field offices started in fiscal year 1989 and continues through-out fiscal year 1990, AGL-200.

2. The following Aviation Safety Analysis Systems (ASAS), AGL-200, are under development in 1989 and 1990 and will be implemented in fiscal year 1990 and subsequent years:
   a. Accident Prevention Subsystem (APS)
   b. Airworthiness Directive Subsystem (AWIS)
   c. Automated Archives for Regulatory Subsystem (AARS)
   d. Rules Genesis Subsystem (RGS)
   e. Policy Memorandum Subsystem (PMS)
   f. Automated Exemptions Subsystem (AES)
   g. National Aircraft Registry Information Subsystem (NARIS)
   h. NTSB Recommendations Subsystem
   i. FAA Recommendations Subsystem
   j. NTSB/FAA Common Data Bases Subsystem
   k. Near Mid-Air Collision Subsystem (NMACS)
   l. Safety Analysis Subsystem (SAS)

3. The Airport Capacity Computer System will be installed in late fiscal year 1989 or early 1990, AGL-600.

4. An automated system that provides direct field update to the National Airport Master Record File is scheduled for implementation in fiscal year 1990, AGL-600.

5. The Grants For Airports Tracking System (GATS) is tentatively scheduled for installation in late fiscal year 1990 or 1991, AGL-600.

6. The Certification/Compliance Management Information System (CCMIS) is scheduled for completion in fiscal year 1991, AGL-600.

7. The Air Traffic Division has developed a region-wide plan for the installation of microprocessors to support general office automation functions at the Towers, Centers and Flight Service Stations. The installation of this equipment will start in fiscal year 1990 and continue into 1991, AGL-500.

8. The Electronic T&A System (ETAMS) was installed at the Indianapolis ARTCC in March 1989. Installation of the system at the remaining three regional centers will continue into fiscal year 1990, AGL-500.

9. The MPP Announcement System was installed in February 1989. Full implementation of the system will start October 1, 1989, AGL-10.

10. The Trimate System which provides for the electronic transmission of training requirements and enrollment information is scheduled for installation in late fiscal year 1989, AGL-10.

11. The following subsystems of the Civil Aviation Security Information System (CASIS) are scheduled for installation in FY90:

    a. Foreign Airport Assessment System, 2nd quarter 1990.
    b. Indirect Airport Carrier System, 2nd quarter 1990.
    c. MIS System, 3rd quarter 1990.

12. A permanent On-Line Requisitioning System which provides on-line ordering from the FAA depot is scheduled for implementation in July 1990. This system will replace the interim system implemented on November 15, 1987, AGL-50

13. The National Airspace System Managers Automation Plan (NASMAP) which is a 5 year plan to establish local area networks with connectivity between sectors, regional, and national offices was started in 1988 and continues into 1993, AGL-400.

14. A major enhancement to the MMS MPS System providing increased processor capability is scheduled for completion in mid-1989. This enhancement provides a basis for the future: (1) transition to facility performance reporting under MMS for the ARTCC's and GNAS sector and (2) the development of the regional office's MMS performance reporting capability to replace the NAPRS functions, AGL-400.

15. By July 1, 1989, the Great Lakes Region's Office Automation System will be expanded to include all division and staff managers and their secretaries. The system runs on a Compaq 386 file server using the Novell operating system. The standard software consists of Word Perfect Office, Word Perfect, Calculator, Calendar, File Management, Program Editor, Notebook, Schedule Management and Electronic Mail. Optional software that is provided includes DBASE III Plus, Lotus 1-2-3, and Org. Plus, AGL-60.

CHAPTER 13. AIRPORTS

The Airport and Airway Improvement Act (AAIA) of 1982 was amended by the Airport and Airway Safety and Capacity Expansion Act of 1987 (Public Law 100-223) on December 30, 1987. It authorized the continued improvement of the nation's airports and airways, using funds that have accumulated in the Airport and Airway Trust Fund established by the Internal Revenue Code of 1954.

The following sections are contained in this chapter:

a. Accomplishments
b. Projected Distribution of Airport Improvement Program Funds
c. System Composition
d. Joint-Use Airports
e. Heliport Planning and Development
f. Selected Items of Airport Development
g. Airport Noise Compatibility Studies
h. Airport Capacity
i. High-Impact Projects/Items
j. Significant Airport Paving and Lighting Rehabilitation Projects

a. **Accomplishments** (January 1, 1988 - December 31, 1988)

During FY-88 the Great Lakes Region issued more grants and obligated more AIP funds than originally planned (see Table 13a-1)

TABLE 13a-1
GREAT LAKES REGION
AIP PROGRAM - FY-88

Fund Category	Planned			Actual		
	Entitlements	Discretionary	Total $ in millions	Entitlements	Discretionary	Total $ in millions
Total AIP Authorization Nationwide			1270			1289
Primary (Percent of Total)	78.4	10.3	88.7	80.8	53.5	134.3
Commercial Service (Percent of Total)	0	6.5	6.5	0	9.2	9.2
State (Percent of Total)	26.4	0	26.4	26.5	2.5	29.0
Relievers (Percent of Total)	0	13.3	13.3	0	26.4	26.4
Noise, System & Master Plans (Percent of Total)	0	21.2	21.2	0	26.7	26.7
Total dollars			156.1			225.6
No. of Grants			194			215
Regional Share in Percent (%)			12			17.5

1. New Airports. The following new publicly owned airports were established:

Illinois

-

Indiana

-

Michigan

-

Minnesota

- Litchfield Municipal Airport, Litchfield, Minnesota. Is under construction.

North Dakota

-

South Dakota

- (New) Sturgis Municipal Airport, Sturgis, South Dakota. Is currently being designed.

Wisconsin

-

2. Acquisition of Private Airports. The following private airports have been purchased by public bodies:

Illinois

- Lewis University Airport, Romeoville, Illinois. A grant was issued to the Joliet Regional Port District for the partial acquisition of this privately owned reliever to Chicago's Midway Airport in FY-88. A follow-on grant for clear zone land and runway rehabilitation is planned for FY-89 in order to keep this reliever open for its intended purpose.

Indiana

-

Michigan

-

Minnesota

-

North Dakota

-

Ohio

-

South Dakota

- Great Planes Airport, Tea, South Dakota. A grant was issued to the County of Lincoln to purchase The Great Planes Private Airpark.

Wisconsin

-

3. **New Runways.** Table 13a-3 shows new runways that are physically complete, under construction, or have been funded under an AIP grant.

TABLE 13a-3
ACCOMPLISHMENTS - NEW RUNWAYS

	ASSOCIATED CITY	AIRPORT NAME	ACCOMPLISHMENT
IL	Lacon	Marshall County	Runway 13/31 physically complete.
IN	Elkhart	Elkhart Municipal	Runway 9/27 under construction.
	Indianapolis	Indianapolis International	Runway 4R/22L under construction.
MI	Big Rapids	Roben-Hood	Runway 9/27 under construction.
	Holland	Tulip City	Runway 8/26 physically complete.
MN	Litchfield	Litchfield Municipal	Runway 13/31 under construction.
ND	Casselton	Casselton Municipal	Runway 13/31 physically complete.
OH	Port Clinton	Carl R. Keller Field	Replacement Runway 17/35 under grant, construction should begin Summer of 1989 subject to completion of land acquisition.
SD	Brookings	Brookings Municipal	Runway 17/35 physically complete.
	Eagle Butte	Cheyenne Eagle Butte	Runway 13/31 physically complete.
WI	East Troy	East Troy Municipal	Runway 8/26 physically complete.

4. **Runway Extensions.** Table 13a-4 shows runway extensions that are physically complete, under construction or have been funded under an AIP grant.

TABLE 13A-4
ACCOMPLISHMENTS - RUNWAY EXTENSIONS

	ASSOCIATED CITY	AIRPORT NAME	ACCOMPLISHMENT
IL	Alton	St. Louis Regional	Runway 11/29 extension under grant.
	Cahokia	St. Louis Downtown Parks	Runway 12R/30L extension under grant.
	Decatur	Decatur	Runway 6/24 ext. under construction.
	Kankakee	Greater Kankakee	Runway 6/24 ext. under construction.
	Lansing	Lansing Municipal	Runway 9/27 ext. under construction.
	Lincoln	Logan County	Runway 3/21 ext. under construction.
	Marion	Williamson County	Runway 11/29 ext. physically complete.

	Pekin	Pekin Municipal	Runway 9/27 ext. physically complete.
	Peoria	Mt. Hawley	Runway 17/35 extension under grant.
	Rochelle	Rochelle Municipal	Runway 7/25 ext. physically complete.
IN	Indianapolis	Indianapolis Metropolitan	Runway 32 ext. physically complete.
	South Bend	Michiana Regional	Runway 18 extension under grant.
MI	Dowagiac	Cass County Memorial	Runway 9/27 ext. physically complete.
	Hastings	Hastings	Runway 12/30 ext. physically complete.
	Midland	Jack Barstow	Runway 6/24 ext. physically complete.
	Saginaw	Tri-City	Runway 14/32 ext. physically complete.
MN	St. Paul	St. Paul Downtown Holman Field	Runway 14/32 ext. physically complete.
ND	Grand Forks	Grand Forks-Mark Andrew International	Runway 17L/35R ext. physically complete.
OH	Dayton	Dayton International	Runway 18 ext. physically complete. Runway 24R extension under grant.
	Kent	Kent State University	Runway 5/23 ext. physically complete.
	Willoughby	Lost Nation	Runway 5/23 ext. physically complete.
SD	None	-	-
WI	Appleton	Outagamie County	Runway 11/29 ext. physically complete.
	Medford	Taylor County	Runway 15/33 ext. physically complete.
	Mineral Point	Iowa County	Runway 4/22 ext. physically complete.
	Monroe	Monroe Municipal	Runway 12/30 ext. physically complete.
	Osceola	L.O. Simenstad Municipal	Runway 10/28 ext. physically complete.
	Oshkosh	Wittman Field	Runway 18/36 ext. physically complete.
	Shawano	Shawano	Runway 11/29 ext. physically complete.

b. **Projected Distribution of AIP Funds**

Table 13b-1 shows the proposed and anticipated distribution of funds under the Airport Improvement Program (AIP) and successor legislation in the Great Lakes Region during fiscal years 1989-1991. As can be seen from the Table, both dollars amounts and number of grants are expected to remain level through the coming years.

TABLE 13b-1
GREAT LAKES REGION

AIP PROGRAM - FY-89 THROUGH FY-91

Fund Category	FY-89 Entitlements	FY-89 Discretionary	FY-89 Total $ in millions	FY-90* Entitlements	FY-90* Discretionary	FY-90* Total $ in millions	FY-91* Entitlements	FY-91* Discretionary	FY-91* Total $ in millions
Primary (Percent of Total)	90.4	4.0	94.4 (53)	87.1	3.9	91.0 (53)	87.1	3.9	91.0 (53)
Commercial Service (Percent of Total)	0	6.4	6.4 (4)	0	6.2	6.2 (4)	0	6.2	6.2 (4)
State (Percent of Total)	29.1	0	29.1 (16)	28.1	0	28.1 (16)	28.1	0	28.1 (16)
Relievers (Percent of Total)	0	24.0	24.0 (14)	0	23.1	23.1 (14)	0	23.1	23.1 (14)
Noise & System Plans (Percent of Total)	0	22.7	22.7 (13)	0	21.8	21.8 (13)	0	21.8	21.8 (13)
Total Dollars			176.6			170.2			170.2
No. of Grants			184			180			180
AIP Available Level Nationwide			1400			1350			1350
Regional Share in Percent (%)			13			13			13

NOTE: Authorized funding level is 1400 for FY-89

*This amount is predicated on continued funding restrictions under Gramm-Rudman.

c. **System Composition**

The airport system in the Great Lakes Region, both present and future (1-5 years), as included in the National Plan of Integrated Airport Systems (NPIAS), is presented in Tables 13c-1 and 2. These tables indicate an identified need for an additional 15 heliports and 45 general aviation and 7 reliever airports in the 5-year planning period to satisfy the national interest airport need. Since the NPIAS is continuously being revised, the system expansion shown in Tables 13c-1 and 2 should be viewed as a macro projection.

Due to budgetary constraints and necessary development at existing airports, not every identified need will be satisfied. At this time, based on future funding projections, we anticipate development of one new heliport and one new general aviation airport and the acquisition of two private reliever airports during the next 3 fiscal years. (See Table 13c-3.)

The abbreviations used in the tables are defined below:

Service Level - An indicator of the highest level of services available to the public at the airport (also related to Federal funding of development).

PR - Primary service airport.

CM - Commercial service other than primary airports.

RL - Reliever airport or heliport.

CR - Commercial service and reliever airport (one airport that serves both functions).

GA - General aviation

HE - Heliport

TABLE 13c-1
AIRPORT SYSTEM COMPOSITION - BY STATE - BASED ON NPIAS
AS OF APRIL 30, 1989

STATE	SERVICE LEVEL	*EXISTING AIRPORTS TOTAL	*EXISTING AIRPORTS PRIVATE	RECOMMENDED ADDITIONS TO THE SYSTEM 1-5	TOTAL AIRPORTS 5-YEAR PLAN
IL	HE	0	0	2	2
IL	CM	6	0	0	6
IL	CR	0	0	0	0
IL	GA	55	12	8	63
IL	FR	10	0	2	12
IL	RL	12	4	2	14
		83	16	14	97
IN	HE	1	0	0	1
IN	CM	7	0	0	7
IN	GA	44	5	14	58
IN	FR	3	0	0	3
IN	RL	9	2	0	9
		64	7	14	78
MI	HE	0	0	11	11
MI	CM	7	0	0	8*
MI	GA	67	6	8	74*
MI	FR	12	0	0	12
MI	RL	7	1	4	11
		98	7	23	116
MN	HE	0	0	1	1
MN	CM	5	0	0	5
MN	GA	63	0	6	69
MN	FR	7	0	0	7
MN	RL	7	1	0	7
		82	1	7	89
ND	HE	0	0	0	0
ND	CM	4	0	0	4
ND	GA	41	0	2	41
ND	FR	3	0	0	3
ND	RL	0	0	1	1
		48	0	1	49
OH	HE	0	0	2	2
OH	CM	0	0	0	0
OH	GA	78	8	3	81
OH	FR	7	0	0	7
OH	RL	14	4	0	14
		99	12	5	104

*One GA becomes a CM in the 1-5 time period

Table 13c-1 (cont.)
AIRPORT SYSTEM COMPOSITION - BY STATE - BASED ON NPIAS
AS OF APRIL 30, 1989

STATE	SERVICE LEVEL	*EXISTING AIRPORTS TOTAL	*EXISTING AIRPORTS PRIVATE	RECOMMENDED ADDITIONS TO THE SYSTEM 1-5	TOTAL AIRPORTS 5-YEAR PLAN
SD	HE	0	0	0	0
SD	CM	7	0	0	7
SD	GA	47	0	1	48
SD	PR	2	0	0	2
SD	RL	0	0	0	0
		56	0	1	57
WI	HE	0	0	0	0
WI	CM	6	0	0	6
WI	GA	62	5	6	68
WI	PR	7	0	0	7
WI	RL	6	2	0	6
		81	7	6	87

TABLE 13c-2
AIRPORT SYSTEM COMPOSITION - REGIONAL - BASED ON NPIAS
AS OF APRIL 30, 1989

SERVICE LEVEL	*EXISTING AIRPORTS TOTAL	PRIVATE	RECOMMENDED ADDITIONS TO THE SYSTEM (1-5 YEARS)	TOTAL AIRPORTS (5-YR PLAN)
HE	1	0	16	17
CR	0	0	0	0
CM	42	0	1	43
GA	457	36	45	502
PR	51	0	2	53
RL	55	14	7	62
	606	50	71	677

NOTE: * Existing airports (public and private) which meet current criteria.

Table 13c-3
SYSTEM EXPANSION

The following new heliport/airport facilities have a possibility of being developed during the next 3 fiscal years:

NEW HELIPORT	
OH	Cincinnati Columbus
NEW GENERAL AVIATION AIRPORT	
MN	Wadena
NEW RELIEVER AIRPORTS	
MI	Mt. Clemens (Acquisition of private airport or land acquisition for a new site)

d. Joint-Use Airports

Nationally there are 25 joint-use agreements presently in effect at domestic military airfields.

1. Existing Joint-Use Agreements

There are currently three joint use agreements in effect in the Great Lakes Region. These sites are listed below with additional information on two of these airports.

Fort McCoy Airfield at Sparta, Wisconsin
The city of Sparta, Wisconsin has signed a Joint-Use Agreement with Fort McCoy Airfield. Presently, the airport is being developed through state and local resources. The State has sponsored a project to construct a terminal area and an entrance road.

Grayling Army Airfield at Grayling, Michigan
No additional information available.

Rickenbacker Airport at Columbus, Ohio
The amended master lease between Rickenbacker Port Authority (sponsor) and Diversified/Turner was reviewed by FAA. The sponsor is in the process of making appropriate revisions. FAA issued a FY-88 grant for SRE, signs, HIRL's and runway sensors; issued a FY-89 grant for soundproofing two schools; and will issue a FY-89 grant for Taxiway "A" drainage improvements. The NEM's prepared under a Part 150 Study have been accepted by FAA and the NCP resulting from this study is in the 180 day review period. The master plan is under review by the DET-ADO. The sponsor and the Air Force are in the process of amending the Joint Use Agreement, including a proposal to transfer the airfield operations and maintenance to the sponsor. Flying Tiger/Federal Express will move operations from Rickenbacker to Indianapolis on August 1, 1989. The sponsor is proceeding with plans to install a Cat I ILS to Runway 5L, a Cat I ILS to Runway 32L, and upgrade Runway 5R ILS to Cat II, all with sponsor funds.

2. Proposed Joint-Use Agreements

Two sites are currently under investigation for joint-use in the Great Lakes Region. These sites are listed below.

Scott Air Force Base, Belleville, Illinois
The State of Illinois is actively pursuing joint use of Scott Air Force Base in Belleville, Illinois. A grant was executed by the State of Illinois on September 4, 1986 for a master plan study. The master plan study, including preparation of an ALP, environmental assessment and a Description of Proposed Action and Alternation (DOPAA), is being reviewed by the Air Force. This will be used to determine what additional work will need to be done by a consultant for the Air Force to prepare an Environmental Impact

Statement. This study will be funded by an FAA grant. The Environmental Impact Statement is expected to be completed in 1990 and will be the basis of a Joint-Use Agreement between the state of Illinois/St. Clair County and the Air Force.

Selfridge ANG Base, Port Huron, Michigan.
The FY-88 appropriations Bill (HR-100-498) directed the FAA to report to Congress on the technical feasibility of joint civil/military use at Selfridge ANG Base. The report (DOT/FAA/PP-88-5) concluded that joint use was technically feasible.

In 1986, the county of Macomb received an airport master plan grant. This study will look at the three privately owned airports, Selfridge ANGB and several new sites for a publicly owned airport. If the study recommends Selfridge ANGB as a site, the county will pursue a joint use agreement.

e. **Heliport Planning and Development**

1. Chicago, Illinois

A Heliport/Helistop Task Force has been formed with the goal of developing public heliport facilities for Chicago. Included on the Task Force are representatives from the City of Chicago, the Illinois Division of Aeronautics, and the FAA, along with representatives of private interest groups. The purpose of the Task Force is to determine the feasibility of developing specific sites in the Chicago metropolitan area, in particular the Chicago central core.

There are currently 64 certificated heliports/helistops in the Chicago area, of which 20 are emergency use facilities for hospitals, while the remaining 44 are for corporate, military, governmental, or private use. Meigs Field currently serves a dual role as a downtown airport and heliport and is the only public-use helicopter landing site for downtown Chicago. Emphasis is being given to a downtown Chicago public-use heliport. It is hoped that the Chicago Heliport/Helistop Task Force will serve as the impetus for the development of a public-use facility for downtown Chicago.

A helicopter route chart was prepared by FAA for the Chicago Metropolitan area. It became available the first part of May 1988. The chart makes it easier for pilots to navigate through the heavily populated urban area. Routes included on the chart try to direct pilots to fly over land uses that are more compatible with the noise generated by helicopters.

2. Columbus, Ohio

The master plan study funded during FY-84 for a public-use heliport in downtown Columbus is complete. To date, no action has been taken by the sponsor to implement the master plan.

3. State of Minnesota

The Minneapolis-St. Paul Metro System Plan completed in June, 1986, recommended a study be made for a public heliport in the metro area. A FY-87 continuous system planning grant included a heliport feasibility study as a work item. The study is scheduled for completion in mid-1989. In addition to the Metro System Plan, the State of Minnesota is currently updating their system plan. One element of the State Plan is a Heliport Study for the area outside the metro area. This study will be coordinated with the Metro Study.

4. State of Ohio

A system planning grant was issued to the State of Ohio in September 1985 in which a key element is a heliport system plan. The heliport section of the Ohio Airport System Plan (OASP) has been completed.

5. Grand Rapids, Michigan

Kent County is sponsoring an Airport Master Plan/Site Selection Study for a heliport to serve Grand Rapids, Michigan. A grant was issued in July of 1988. The study should start in the Spring of 1989 and be completed by March, 1990.

6. State of Michigan

A grant was issued in 1984 to the State of Michigan for a statewide heliport study. The consultant completed the study in December, 1985. The report recommended eleven new heliport sites for the state. All eleven sites have been included in the NPIAS.

f. Selected Items of Airport Development

A few of the key airport development items have been selected for presentation based on their work-generating characteristics. The new runways, runway extensions, and NAVAIDS (non-F&E) that we expect to be able to fund through FY-92, subject to favorable environmental review, are presented in Tables 13f-1, 2, and 3.

The lead office in the FAA for these projects is the Airports Division. The contact persons, located in the Airports District Offices (ADO's) are:

Illinois) Indiana)	Louis Yates - Chicago ADO - (312) 694-7335
Wisconsin) South Dakota) Minnesota) North Dakota)	Frank Benson - Minneapolis ADO - (612) 725-4221
Michigan) Ohio)	Peter Serini - Detroit ADO - (313) 484-3100

TABLE 13f-1
NEW RUNWAYS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	NEW RUNWAY	PURPOSE*
IL	Bloomington	Bloomington/Normal	2/20	Standards
	Benton	Benton Municipal	8/26	Standards
	Champaign/Urbana	University of Illinois-Willard	14/32	Capacity
	Chicago/West Chicago	DuPage	1/19	Capacity
	DeKalb	DeKalb Municipal	9/27	Standards (Replacement)
	Joliet	Joliet Park District	4/22	Standards
IN	Indianapolis (Greenwood)	Greenwood Municipal	1/19	Standards (Replacement)
	Indianapolis	Indianapolis Metropolitan	3/21	Standards
	Indianapolis	Terry	9/27	Standards
	Shelbyville	Shelbyville Municipal	18/36	Standards (Replacement)
MI	Detroit	Detroit Metro	9R/27L	Capacity
	Evart	Evart Municipal	8/26	Standards
MN	Dodge Center	Dodge Center	16/34	Standards
	Litchfield	Litchfield Municipal	13/31	New Airport - Community
	Park Rapids	Park Rapids Municipal	17/35	Standards
	Ramsey	Gateway North Industrial	NW/SE	Standards
	Wadena	Wadena Municipal	14/32 & 6/24	New Airport (Replacement)
	Waseca	Waseca Municipal	3/21	Standards
	Willmar	Willmar Municipal	4/22	Standards
ND	Cavalier	Cavalier Municipal	16/34	Standards (Replacement)
OH	Columbus	Bolton Field	9/27	Standards
	Delaware	Delaware Municipal	10/28	Upgrade (Replacement)
	Hamilton	Hamilton	11/29	Standards
	Port Clinton	Port Clinton	N/S	Standards (Replacement)
	Urbana	Grimes Field	3/21	Standards (Replacement)
SD	Brookings	Brookings Municipal	N/S	Standards
	Eureka	Eureka Municipal	12/30	Standards
	Sturgis	Sturgis Municipal	18/36	Standards
	Tea	Great Planes	16/34	Standards
WI	Eagle River	Eagle River Union	E/W	Standards
	Ft. Atkinson	Ft. Atkinson Municipal	3/21	Standards
	Green Bay	Austin Straubel Field	12/30	Standards
	Hartford	Hartford Municipal	8/26	Standards
	Platteville	Grant County	9/27	Standards
	Viroqua	Viroqua Municipal	2/20	Standards
	Watertown	Watertown Municipal	5/23	Standards
	Wautoma	Wautoma Municipal	SE/NW	Standards

*See terms at the bottom of pages 13-16

TABLE 13f-2
RUNWAY EXTENSIONS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	RUNWAY	PURPOSE*	AFFECTED NAVAIDS
IL	Aurora	Aurora Municipal	9/27	Upgrade	ILS
	Cairo	Cairo Municipal	14/32	Standards	-
	Casey	Casey Municipal	4/22	Standards	-
	Champaign/Urbana	University of Illinois-Willard	4/22	Standards	-
	DeKalb	DeKalb Municipal	9/27	Standards/Upgrade	-
	Fairfield	Fairfield Municipal	9/27	Upgrade	-
	Freeport	Albertus	6/24	Standards/Upgrade	-
	Metropolis	Metropolis Municipal	18/36	Upgrade	-
	Peoria	Greater Peoria	4/22	Upgrade	-
	Peru	Illinois Valley Regional	18/36	Upgrade	-
	Pinckneyville-DuQuoin	Pinckneyville-DuQuoin	18/36	Upgrade	
IN	Auburn	DeKalb County	9/27	Standards	VASI, REIL
	Bloomington	Monroe County	17/35	Upgrade	VASI
	Greencastle	Putnam County	18/36	Standards	VASI
	Huntingburg	Huntingburg	9/27	Standards	REIL
	Indianapolis	Terry	9/27	Standards	VASI, REIL
	Kendallville	Kendallville Municipal	9/27	Standards	REIL
	Madison	Madison Municipal	3/21	Standards	VASI
MI	Cadillac	Wexford County	7/25	Standards	-
	Lakeview	Lakeview	9/27	Standards	-
	Pontiac	Oakland-Pontiac	9L/27R	Capacity	-
	Port Huron	St. Clair County	11/29	Standards	-
	St. Ignace	Mackinac County	7/25	Standards	ILS, MALSR
	Detroit	Detroit Metro	3L/21R	Upgrade	REIL
MN	Crookston	Crookston Municipal	13/31	Standards	VADI, REIL
	Dodge Center	Dodge Center	14/32	Standards	REIL
	Fergus Falls	Fergus Falls Municipal Einar Mickelson	13/31	Standards	MIRL, VASI, ILS
	Lakeville	Airlake	11/29	Standards	
	Minneapolis	Anoka County-Blaine	8/26	Standards	ILS/SSALR
	Minneapolis	Minneapolis-St. Paul Int'l.	4/22	Upgrade/Capacity/Environment	VASI, NDB
	Orr	Orr Regional	13/31	Standards	-
	Preston	Fillmore County	10/28	Standards	PAPI, REIL
	Red Wing	Red Wing Municipal	9/27	Standards	-
	Roseau	Roseau Municipal	16/34	Standards	-
	Springfield	Springfield Municipal	13/31	Standards	-
	Waseca	Waseca Municipal	15/33	Standards	

TABLE 13f-2 (Cont'd)
RUNWAY EXTENSIONS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	RUNWAY	PURPOSE*	AFFECTED NAVAIDS
ND	Devils Lake	Devils Lake Municipal	13/31	Upgrade	VASI, REIL
	Dickinson	Dickinson Municipal	14/32	Standards	VASI, REIL
	Hettinger	Hettinger Municipal	12/30	Standards	-
	Kenmare	Kenmare Municipal	8/26	Standards	-
	Kindred	Kindred Municipal	15/33	Standards	-
	Pembina	Pembina Municipal	15/33	Standards	-
OH	Chillicothe	Ross County	4/22	Standards	-
	Circleville	Pickaway County Memorial	1/19	Standards	REIL
	Columbus	Port Columbus Int'l.	10L/28R	Upgrade/Capacity	ILS, SSALR
	Elyria	Lorain County	7/25	Upgrade	LOCALIZER
	Kent	Kent State University	18/36	Standards	VASI
	Lima	Lima-Allen County	9/27	Upgrade	LOCALIZER
	Port Clinton	Carl Keller Field	8/26	Standards	-
	Toledo	Toledo Express	7/25	Upgrade	ILS, ALS
	Van Wert	Van Wert Municipal	9/27	Standards	REIL
SD	Chamberlain	Chamberlain Municipal	13/31	Standards	-
	Parkston	Parkston Municipal	15/33	Standards	-
	Tea	Great Planes	16/34	Standards	-
WI	Hartford	Hartford Municipal	11/29	Standards	-
	Mosinee	Central Wisconsin	17/35	Upgrade	-
	Neilsville	Neilsville Municipal	9/27	Standards	-
	Oconto	Oconto Municipal	11/29	Standards	-
	Waukesha	Waukesha County	10/28	Upgrade	MALSR
	Wausau	Wausau Municipal	12/30	Standards	-

*See explanation of terms at end of section

The following terms are used to describe the purpose of the project:

Standards

Bring existing airport up to recommended standards based on the current design use (BU, GU, etc.) of the airport.

Upgrade

Development warranted to accommodate larger, more demanding aircraft or to permit longer non-stop flights and greater load factors.

Capacity

Development required to increase system capacity. It includes any development that will increase the capacity of an airport beyond its current designed use.

New Airport-Capacity

Development of a new reliever or supplementary commercial service airport to increase airport system capacity in a metropolitan area.

New Airport-Community

Development of a new airport which will be the major airport facility serving the community.

Environment

Implementation of plans prepared in accordance with FAR Part 150 as well as any other development that is intended primarily to relieve noise problems or other adverse environmental impact.

TABLE 13f-3
NAVAIDS (Non-FAE) IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	RUNWAY	FACILITY
IL	Carbondale	Southern Illinois	36	REIL
	Joliet	Joliet Park District	12/30	REIL
	Lansing	Lansing Municipal	9/27	VADI, REIL
	Mattoon	Coles County Memorial	11/29	PAPI
	Mt. Carmel	Mt. Carmel Municipal	4/22	VADI
	Quincy	Baldrin Field	13/31	PAPI, REIL
	Waukegan	Waukegan Regional	14	REIL
IN	Elkhart	Elkhart Municipal	17/35	REIL
	Evansville	Dress Regional	22	PAPI
	Fort Wayne	Fort Wayne Municipal (Baer Field)	23	REIL
	Greencastle	Putnam County	18/36	PAPI, REIL
	Indianapolis	Indianapolis International	4R	ILS,(CATII/III)/ALS
	Indianapolis	Indianapolis International	22L	ILS/MALSR
	Jeffersonville	Clark County	18	ILS/MALSR
	Lafayette	Purdue University	10	PAPI
	Madison	Madison Municipal	3/21	PAPI, REIL
	Peru	Peru Municipal	1	REIL
	Shelbyville	Shelbyville Municipal	18/36	PAPI, REIL
	South Bend	Michiana Regional	9/27,36	PAPI
	South Bend	Michiana Regional	18/36	REIL
MI	Adrian	Lenawee County	5/23	REIL
	Howell	Livingston County	13/31	PAPI
	Jackson	Jackson County	14/32	REIL
	Owosso	Owosso Community	10	REIL
	Port Huron	St. Clair County International	10/28	PAPI
	South Haven	South Haven Regional	4/22	PAPI, REIL
MN	Crookston	Crookston Municipal	13/31	PAPI, REIL
	Dodge Center	Dodge Center	14/32	VADI, REIL
	Fairmont	Fairmont Municipal	2/20	REIL
	Fergus Falls	Fergus Falls Municipal	17/35	PAPI
	Litchfield	Litchfield Municipal	13/31	PAPI
	Mankato	Mankato Municipal	33	ILS
	Marshall	Marshall Municipal	12/30	ILS
	Orr	Orr Regional	13/31	PAPI
	Owatonna	Owatonna Municipal	12	ODAL,VADI
	Park Rapids	Park Rapids Municipal	13/31	VADI, MALS
	Preston	Fillmore County	10/28	PAPI, REIL, ODAL
	Ramsey	Gateway North Industrial	NW/SE	VADI, REIL
	Red Wing	Red Wing Municipal	9/27	TVOR/DME - MALS/REIL-ODAL
	Rochester	Rochester Municipal	13/31	PAPI
	Roseau	Roseau Municipal	16	REILS
	St. Cloud	St. Cloud Municipal	31	ILS

TABLE 13f-3 (Cont'd)
NAVAIDS (Non-F&E) IN NEXT THREE YEARS

ND	Bottineau	Bottineau Municipal	16/34	PAPI
	Cavalier	Cavalier Municipal	12/30	PAPI
	Hettinger	Hettinger Municipal	12/30	PAPI
	Kindred	Kindred Municipal	15/33	PAPI
	Oakes	Oakes Municipal	12/30	PAPI
	Pembina	Pembina	15/33	PAPI
OH	Bowling Green	Wood County	6/24	PAPI, REIL
	Chillicothe	Ross County	4/22	PAPI, REIL
	Circleville	Pickway County Memorial	1/19	PAPI, REIL
	Delaware	Delaware Municipal	10/28	PAPI, REIL
	Medina	Freedom Field	9/27	PAPI
	Van Wert	Van Wert	9	REILS
	Willoughby	Lost Nation	5/23	PAPI
SD	Brookings	Brookings Municipal	17/35	PAPI
	Huron	Huron Regional	17/35	PAPI
	Pierre	Pierre Municipal	31	PAPI
	Rapid City	Rapid City Regional	32	PAPI
	Tea	Great Planes/Lincoln Co.	16/34	PAPI
WI	Appleton	Outagamie County	29	ILS
	Eau Claire	Eau Claire County	32	REIL
	Fond du Lac	Fond du Lac County	18	PAPI
	Kenosha	Kenosha Municipal	6L	ILS
	Racine	Horlick-Racine	4, 14/32	PAPI
	Waukesha	Waukesha County	28	PAPI
	West Bend	West Bend Municipal	6/24	PAPI

g. **Airport Noise Compatibility Studies** (FAR Part 150 Studies)

1. The following noise compatibility programs (NCP) were approved:

St. Louis Regional Airport, East Alton, Illinois (FAA Funded). The Noise Exposure Maps were accepted by the FAA on October 7, 1985. The Noise Compatibility Program was approved by the FAA on November 13, 1986. It was the first NCP approved in the Great Lakes Region.

Cleveland-Hopkins International Airport, Cleveland, Ohio (Locally Funded). The Noise Exposure Maps were accepted by the FAA on July 3, 1984. The Noise Compatibility Program was approved by the FAA on August 18, 1987.

Port Columbus International Airport, Columbus, Ohio (FAA Funded). The Noise Exposure Maps were accepted by the FAA on July 28, 1987. The Noise Compatibility Program was approved by the FAA on September 25, 1987.

Dayton International Airport, Dayton, Ohio (FAA Funded). The Noise Exposure Maps were accepted by the FAA on June 22, 1988. The Noise Compatibility Program was approved by FAA on September 14, 1988 and the revised Noise Exposure Maps were accepted September 23, 1988.

Indianapolis International Airport, Indianapolis, Indiana (FAA Funded). The Noise Exposure Maps were accepted by the FAA on June 24, 1988. The Noise Compatibility Program was approved by the FAA on September 14, 1988.

2. The following studies are in progress:

(a) FAA-funded studies:

(1) Pal-Waukee Airport, Prospect Heights/Wheeling, Illinois. Noise Exposure Maps have been accepted by the FAA. The Noise Compatibility program is complete and awaiting FAA review. Approval of the Noise Compatibility Program is expected by mid-1989.

(2) Wittman Field, Oshkosh, Wisconsin. The noise exposure map and noise compatibility program were submitted to the FAA in March, 1987. FAA preliminary review of these submittals found that the documents were not in compliance with FAR Part 150. The sponsor revised the submittals and they are undergoing FAA review.

(3) Minneapolis-St. Paul International Airport, Minneapolis, Minnesota. The Noise Exposure Maps and Noise Compatibility Program were submitted to the FAA in October 1987. Corrected Noise Exposure Maps were submitted in January 1988. Preliminary FAA review of

these submittals found that the documents were not in compliance with FAR Part 150. The sponsor is revising the submittals.

(4) Midway Airport, Chicago, Illinois. The preparation of Noise Exposure Maps and the Noise Compatibility Program is currently underway in conjunction with a master plan update. Completion is expected by mid-1990.

(5) O'Hare Airport, Chicago, Illinois. The Noise Exposure Maps have been reviewed and the comments sent to the sponsor. Awaiting response from the sponsor. Acceptance of the maps expected by mid-1989. Completion of the NCP is expected in late-1989. The study is complicated by the adversarial relationship between the city and the suburbs.

(6) Rickenbacker Airport, Columbus, Ohio. The Noise Exposure Maps were accepted by FAA on January 13, 1989. The Noise Compatibility Program was accepted for official review on January 13, 1989 and approval is expected on or before July 12, 1989.

(7) Detroit Metropolitan-Wayne County Airport, Detroit, Michigan. A draft copy of the Noise Exposure Maps is undergoing FAA review. A Noise Compatibility Program and Master Plan update is expected to be completed by June 1989.

(8) Waukegan Regional Airport, Waukegan, Illinois. Revised Noise Exposure Maps have been completed and submitted for FAA review. The Noise Compatibility Program has been prepared and is undergoing local review. Acceptance of the Noise Exposure Maps and approval of the Noise Compatibility Program by the FAA is expected by late-1989.

(9) Hulman Regional Airport, Terre Haute, Indiana. The Noise Exposure Maps were accepted by FAA on January 13, 1989. The Noise Compatibility Program is expected to be submitted to FAA during the Spring of 1989. Approval of the Noise Compatibility Program is expected by the end of 1989.

(10) Akron-Canton Regional Airport, Akron, Ohio. Both the Noise Exposure Maps and the Noise Compatibility Program are complete and being reviewed by FAA. Acceptance of the Noise Exposure Maps and approval of Noise Compatibility Program by the FAA is expected by September 1989.

(11) Lorain County Regional Airport, Lorain/Elyria, Ohio. The study is in progress and should be completed in the Fall of 1989.

(12) Ohio State University Airport, Columbus, Ohio. The study is in process and should be completed by late 1989.

(13) University of Illinois Willard Airport, Champaign/Urbana, Illinois. A grant was issued in FY-1987 and the study is underway. Completion is expected by late-1989.

(14) Capital Regional Airport, Springfield, Illinois. A grant was issued in FY-1987 and the study is underway. Completion is expected by late-1989.

(15) Decatur Airport, Decatur, Illinois. A grant was issued in FY-1987 and the study is underway. Completion is expected by late-1989.

(16) Detroit City Airport, Detroit, Michigan. A grant was issued in late FY-87. The study is underway and should be completed by late 1990.

(17) Grand Rapids Airport, Grand Rapids, Michigan. A grant was issued in late FY-87. The study should begin in the spring of 1989 and be completed in 18 months.

(18) Oakland-Pontiac Airport, Pontiac, Michigan. A grant was issued in FY-88. The study will begin in the spring of 1989 and be completed in 18 months.

(19) Tri-City Airport, Saginaw, Michigan. A grant was issued in FY-88 and the study is underway. Completion is expected by late 1989.

(20) Bishop Airport, Flint, Michigan. A grant was issued in FY-88. The study is underway and should be completed by late 1990.

(21) Bolton Field Airport, Columbus, Ohio. An amendment to the AIP 3-39-0026-01 grant was signed in July 1988 adding the Part 150 Study and Master Plan Update. The study is underway and should be completed by spring of 1990.

(22) Mansfield Lahm Municipal Airport, Mansfield, Ohio. The study is underway and should be completed by fall 1990.

(23) Toledo Express Airport, Toledo, Ohio. The study is underway and should be completed by fall of 1990.

(24) Greater Rockford Airport, Rockford, Illinois. A grant was issued in FY-88 and the study is underway, with completion expected by late 1990.

(25) Greater Peoria Airport, Peoria, Illinois. A grant was issued in FY-88 and the study is underway with completion expected by late 1990.

(26) Bloomington-Normal Airport, Bloomington, Illinois. A grant was issued in FY-88 and the study is underway, with completion expected by late 1990.

(b) Non-FAA-funded studies:

(1) General Mitchell Field, Milwaukee, Wisconsin. A study to update an ANCLUC to meet FAR Part 150 requirements is underway without Federal funding. Changes at the airport have made this effort inadequate to address the issues now faced by the airport. The sponsor plans to apply for FAR Part 150 funds to undertake a study concurrent with on-going master planning for the airport.

3. Studies proposed:

Illinois

-

Indiana

Fort Wayne Municipal Airport-Baer Field, Fort Wayne

Michigan

Capital City Airport, Lansing
Kalamazoo County Airport, Kalamazoo
Ann Arbor Municipal Airport, Ann Arbor

Minnesota

-

North Dakota

Bismarck Municipal Airport, Bismarck

Ohio

Youngstown Municipal Airport, Youngstown

South Dakota

-

Wisconsin

- Dane County Regional-Truax Field, Madison
- General Mitchell Field, Milwaukee

h. **Airport Capacity**

1. In September 1984, FAA Administrator Engen approved an 11-point FAA capacity enhancement Action Plan which included implementation of a program of airport-specific Task Forces. Further, the Administrator approved the establishment of an Airport Capacity Program Office under the Associate Administrator for Airports and charged that office with agency-wide responsibility for management of all FAA efforts to increase airport capacity, including the delegation of specific program functions. Within the Great Lakes Region, this responsibility is vested in the Airports Division.

2. Program management responsibility for the Airport Task Forces resides in the Airport Capacity Program Office (ACP). FAA is working on a reorganization plan that calls for the abolition of a separate Airport Capacity Program Office and assignment of its duties to a new Operations Research Office, which in turn would report to a newly created assistant administrator's position for advanced design and management control. The role of ACP, or its successor, will be to ensure that Task Force participants are provided a forum with analytical resources sufficient to develop a capacity enhancement Action Plan. This office will be responsible for the scheduling of Task Forces consistent with available resources and ensure that the work of each Task Force is fully coordinated with the appropriate office in FAA headquarters. The Task Forces will become quasi-permanent industry-government committees which will develop an Action Plan and meet periodically to review Action Plan implementation. Detroit, Minneapolis, Chicago, and Cleveland have been identified as candidates for Task Forces. The FAA Capacity Task Force began study of Detroit Metropolitan-Wayne County Airport in April of 1985. The Detroit Airports District Office Manager chairs the task force. Final report issued May 1988.

3. Based on the Administrator's Policy on Capacity Development, emphasis is being given to this type of work under the AIP, especially at the large hub locations. This will include reviewing project plans with sponsors to encourage development needed to alleviate current and forecast capacity problems. Opportunities to assist airport sponsors with such capacity work will be seized at the appropriate time, since many project requests are the culmination of lengthy and sensitive local decision-making.

   In addition, the Air Transport Association (ATA) has identified projects at the 22 pacing airports nationwide that will enhance capacity. These projects have been reviewed along with other capacity projects at our pacing airports. Every effort will be made to fund capacity projects when the work is justified.

Examples of such capacity-enhancing projects are as follows:

- Minneapolis-St. Paul International Airport - An extension to Runway 4/22 and associated taxiways is planned in FY-90 with Federal funds. The extension will increase arrival/departure capacity and distribute noise impacts.

- Chicago-O'Hare International Airport - The extension of Runway 9L-27R to 7,966' has been completed. Funds for the navaid relocation for the Runway 27R extension, in the amount of $650,000, were provided as part of the AIP project.

- Cleveland-Hopkins International Airport - The construction of Taxiway Q, a partial parallel taxiway to Runway 18-36, was funded in FY-85. Construction was completed in the summer of 1987. The taxiway was opened to traffic in 1988 with the completion of the new control tower.

  An extension to Runway 5L was completed in 1987 with federal funds. Taxiway "L" was relocated in 1988 to provide for the relocation of the glide slope antenna for Runway 5R, which restricted use of the Runway 5L extension.

- Detroit Metropolitan-Wayne County Airport - Northwest Airlines and others have approximately $80 million of terminal expansion/modifications underway.

  Wayne County recently completed a financing study which recommended capital improvements at the airport totaling $475,000,000 through 1991. Included are additional runways, taxiways, aprons, terminals, and road improvements, generally all of which are capacity-related.

  The sponsor has submitted a request for a letter of intent ($166,650,000) for a new Runway 9R/27L, Runway 3C extension, a new Runway 4/22 and South Access Road. The development is expected to be completed by 1993.

1. High Impact Projects/Items

The following high impact projects/items are discussed below:

1. Detroit Metro Development
2. Detroit City Airport
3. Chicago-O'Hare International Airport Phase II Development
4. Chicago Regional Area Capacity Study
5. Minneapolis - St. Paul Reliever Airports Study

1. Detroit Metro Development

The capacity of the airport is causing passenger delays and increasing airline operating costs. Detroit's economic recovery,

domestic airline deregulation, and designation of Detroit Metro as Northwest Airlines' major hub have significantly increased commercial service activity. From CY-82 to CY-89 total aircraft operations increased 51 percent (249,128 vs. 375,476). Enplanements have increased 131 percent from CY-82 to CY-88 (4,208,866 vs. 9,799,477). The forecast indicates enplanements will be 11.9M in 1990 and 15.5M by 1995.

2. Detroit City Airport Development

Southwest Airlines initiated commercial jet service from Detroit City Airport on July 6, 1988. Detroit City is the first airport to receive regularly scheduled jet commercial passenger service in 14 years.

Detroit City funded the entire $20M cost of expanding the airport. They refurbished the main terminal, extended Runway 15/33 120 feet, added stopways (283' R/W 15; 590' R/W 33), and strengthen the runway and taxiway system. A Master Plan Study is underway to look at a new runway to accommodate future growth.

3. O'Hare Airport Development

A five-year development program was started in 1985 to provide facilities to accommodate the demand anticipated by 1995. Cost of the program is estimated at $1.6 billion and will be funded by the airlines under an agreement with the City of Chicago. The program evolved from a master plan study that was completed in 1984. The development program includes the following major projects, some of which have already been completed:

- Construct new United Airlines terminal (complete).
- Apron development and expansion of various concourses.
- Relocation of inner and outer taxiway around concourses (complete).
- Relocate and construct international terminal facilities.
- General aviation and commuter facilities.
- Construct people-mover system.
- Extend Runway 9L/27R and attendant taxiways approximately 550 feet at the east end (complete).
- Extend Runway 14R/32L and attendant taxiways - 1,400 feet to the southeast (complete).
- Construct holding pads (complete).

- Construct taxiway bridge over main access road (complete).

4. Chicago Regional Area Capacity Study

$594,000 in AIP funds were granted to the State of Illinois to determine if additional air carrier capacity is needed in the Chicago area. The states of Wisconsin and Indiana also participated in this study. Part 1 of the study, to analyze capacity and potential development of existing airports, determined that airports in Gary, Indiana, and Milwaukee, Wisconsin, should be included in Part 2 of the study, which evaluated possible new sites. It also analyzed the potential for increasing capacity of O'Hare Airport to handle increased passenger levels without additional runways. Part 2, in 1988, concluded that a supplemental airport south of the Chicago Metropolitan Area is needed. A Site Selection and Master Plan study will begin in 1989.

5. Minneapolis-St. Paul Reliever Airports Study.

An AIP system planning grant was issued to the Metropolitan Council for the purpose of doing a Regional Reliever Airports Study to mitigate capacity constraints at Minneapolis-St. Paul International Airport (MSP). The study will determine how a reliever system can most effectively be used as a capacity enhancement tool for MSP. Specific objectives of the reliever system plan are to:

- Identify existing and proposed reliever airports in the Minneapolis-St. Paul area that can accommodate general aviation demand.

- Establish the facility needs and services required at the airports to allow them to effectively achieve their reliever status.

- Identify operational or administrative approaches to achieve maximum system enhancement from a reliever system.

j. Significant Airport Paving and Lighting Rehabilitation Projects

Tables 13j-1 and 13j-2, respectively, show significant airport paving and lighting rehabilitation projects which have been proposed for the next three years.

TABLE 13j-1

PAVEMENT REHABILITATION PROJECTS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	PAVEMENT REHABILITATION PROJECT
IL	Chicago	Chicago Midway	Runways 13L/31R and 13R/31L
	Chicago	Chicago O'Hare International	Runways 4L/22R, 14L/32R and 14R/32L
	Kewanee	Kewanee Municipal	Runway 9/27
	Lacon	Marshall County	Runway 18/36
	Moline	Quad Cities	Air Carrier Apron
	Morris	Morris	Runway 18/36
	Mt. Carmel	Mt. Carmel Municipal	Runway 13/31
	Mt. Vernon	Mt. Vernon-Outland	Runway 5/23
	Pekin	Pekin Municipal	Runway 9/27
	Rockford	Greater Rockford	Runway 12/30
	Romeoville	Lewis University	Runway 9/27
	Springfield	Capital	Runway 18/36 and aprons
IN	Anderson	Anderson Municipal	Runway 12/30
	Auburn	Auburn DeKalb	Runway 9/27
	Fort Wayne	Fort Wayne Municipal (Baer Field)	Terminal apron and select taxiways
	Goshen	Goshen Municipal	Runway 9/27
	Madison	Madison Municipal	Runway 3/21
	South Bend	Michiana Regional	Runway 9/27
	Terre Haute	Hulman Regional	Runway 5/23 and terminal apron
MI	Battle Creek	W.K. Kellogg Regional	Apron
	Benton Harbor	Ross Field	Runway 13/31
	Detroit	Detroit Metro-Wayne County	Runway 9/27
	Detroit	Willow Run	Runway 14/32
	Grand Rapids	Kent County International	Apron
	Grayling	Grayling Army Airfield	Runways 5/23 and 14/32
	Jackson	Jackson County-Reynolds Field	Runway 6/24
	Kalamazoo	Kalamazoo County	Runway 9/27
	Saginaw	Tri-City	Runway 5/23
	St. Ignace	Mackinac County	Runway 7/25
MN	Bemidji	Bemidji-Beltrami County	Runway 7/25
	Crookston	Crookston Municipal	Runway 13/31
	Duluth	Duluth International	Runway 13/31 and construct partial taxiway for Runway 3/21
	Hibbing	Chisholm-Hibbing	Runway 4/22
	International Falls	Falls International	Runway 4/22
	Mankato	Mankato Municipal	Runway 15/33
	Marshall	Marshall Municipal	Runway 12/30
	Minneapolis	Anoka County-Blaine	Runway 8/26
	Minneapolis	Minneapolis/St. Paul International	Runways 4/22 and 11R/29L and select taxiways
	Orr	Orr Regional	Runway 13/31
	Owatonna	Owatonna Municipal	Runway 12/30
	Preston	Fillmore County	Runway 10/28
	Red Wing	Red Wing Municipal	Runway 9/27
	Roseau	Roseau Municipal	Runway 16/34

TABLE 13j-1 (Cont'd)
PAVEMENT REHABILITATION PROJECTS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	PAVEMENT REHABILITATION PROJECT
	St. Paul	St. Paul Downtown-Holman Field	Runways 8/26 and 12/30
	South St. Paul	South St. Paul Municipal	Runway 16/34
	Thief River Falls	Thief River Falls Regional	Runway 13/31 and taxiway
	Two Harbor	Two Harbors Municipal	Runway 6/24 and associated taxiway and apron
	Waseca	Waseca Municipal	Runway 15/33
	Worthington	Worthington Municipal	Runway 11/29
ND	Bottineau	Bottineau Municipal	Runway 12/30
	Cavalier	Cavalier Municipal	Apron
	Devils Lake	Devils Lake Municipal	Terminal and general aviation apron
	Kenmare	Kenmare Municipal	Runway 13/31, apron and taxiway
	Pembina	Pembina Municipal	Runway 13/31, apron and taxiway
OH	Akron	Akron-Canton Regional	Terminal apron
	Chillicothe	Ross County	Runway 4/22
	Cleveland	Cleveland Hopkins International	Runway 5R/23L and terminal apron
	Columbus	Bolton Field	Runway 4/22 and apron
	Columbus	Ohio State University	Runway 9R/27L
	Dayton	Dayton International	Runway 6L/24R
	Marion	Marion Municipal	Runway 12/30
	Springfield	Springfield Municipal	Runway 6/24
	Toledo	Toledo Express	Runway 16/34
	Toledo	Toledo Metcalf Field	Runway 14/32
SD	Aberdeen	Aberdeen Regional	General aviation and air carrier apron
	Brookings	Brookings Municipal	Construct parallel taxiway
	Rapid City	Rapid City Regional	Construct general aviation apron
	Tea	Great Planes	Runway 16/34
WI	Appleton	Outagamie County	Runway 11/29
	LaCrosse	LaCrosse Municipal	General aviation apron
	Milwaukee	General Mitchell Field	Air carrier apron
	Racine	Horlick-Racine	Runway 4/22
	Waukesha	Waukesha County	Runway 10/28 and partial taxiway

TABLE 13j-2
LIGHTING REHABILITATION PROJECTS IN NEXT THREE YEARS

	ASSOCIATED CITY	AIRPORT NAME	LIGHTING REHABILITATION PROJECT
IL	Carbondale	Southern Illinois	Runway 18/36
	Chicago/Lansing	Lansing Municipal	Runway 9/27
	Chicago/West Chicago	DuPage	Runway 15/33 and taxiways
	Decatur	Decatur	Relocate and modernize vault
	Lincoln	Logan County	Runway 3/21
	Litchfield	Litchfield Municipal	Runway 9/27
	Romeoville	Lewis University	Runway 9/27
	Springfield	Capital	Runway 18/36 and taxiways
	Waukegan	Waukegan Regional	Runway 14/32
IN	Goshen	Goshen Municipal	Runway 9/27
	Greencastle	Putnam County	Runway 18/36
	LaFayette	Purdue University	Parallel taxiway for Runway 10/28
	Madison	Madison Municipal	Runway 3/21
	Rensselaer	Jasper County	Runway 18/36
MI	Detroit	Willow Run	Runways 9L/27R, 9R/27L, 14/32 and 5R/23L
	Grand Rapids	Kent County International	Runway 8R/26L
	Kalamazoo	Kalamazoo County	Runway 17/35
	Lakeview	Lakeview Municipal	Runway 9/27
	Pellston	Emmet County	Runway 5/23
	St. Ignace	Mackinac County	Runway 7/25
MN	Crookston	Crookston Municipal	Runway 13/31
	Minneapolis	Minneapolis-St. Paul International	Runway 4/22 (including extension)
	Orr	Orr Regional	Runway 13/31
	Owatonna	Owatonna Municipal	Runway 12/30
	Roseau	Roseau Municipal	Runway 16/34
	South St. Paul	South St. Paul Municipal	Runway 16/34
ND	None	-	-
OH	Chillicothe	Ross County	Runway 4/22
	Circleville	Pickaway County Municipal	Runway 1/19
	Columbus	Port Columbus International	Runway 5/23
	Columbus	Rickenbacker	Runways 5R/23L and 5L/23R
	Toledo	Toledo Express	Vault and entire airfield lighting
	Toledo	Toledo Metcalf Field	Runway 14/32
	Willoughby	Lost Nation	Runway 5/23
SD	None	-	-
WI	Appleton	Outagamie County	Runway 10/28, partial taxiway and vault
	Waukesha	Waukesha County	Runway 11/29

k. **Reliever Airport Development Plan**

The following existing airports have been designated as relievers and are included in their respective State System Plans and in the National Plan of Integrated Airport Systems. An airport layout plan (ALP) has also been completed for these facilities, unless noted otherwise. The development planned at these airports for the next three years has been identified.

1. Illinois

(a) Chicago - O'Hare Relievers:

(1) Pal-Waukee Municipal Airport, Wheeling/Prospect Heights

- Demolition of structure on parcel #27.
- Relocate drainage ditch.
- Acquire land off airport.
- Acquire easements off airport.
- Install fencing (Phase II).
- Relocate navaids.
- Acquire easement off airport (65.77 AC); includes obstruction removal and obstruction lighting.
- Acquire off-airport property for part 77 surface protection and Wolf/Hintz Road relocation.
- Wolf and Hintz Road relocation includes design, bridge construction, ditch and utility relocation, landscaping and lighting (Phase I).

(2) Aurora Municipal Airport, Aurora

- Grade E/W and N/S safety areas.
- Construct west general aviation apron (Phase II).
- Reconstruct, overlay, mark existing general aviation apron; adjust tiedowns; install terminal area security fence and automatic gates (Phase II).
- Acquire self-propelled snow sweeper.
- Reconstruct, overlay, mark existing general aviation apron; adjust tiedowns; install terminal area security fence and automatic gates (Phase III).

- Acquire land for clear zone and development.

(3) DuPage Airport, West Chicago

- Rehabilitation airport lighting.
- Land acquisition (317± acres) for new runways and clear zones.
- Construct new runways 1L/19R and 1R/19L with parallel and connecting taxiways, including drainage work.
- Relocate railroad, Hawthorne Lane and utilities.

(4) Waukegan Memorial Airport, Waukegan

- Construct and light new apron and taxiways.
- Replace lights on Runway 14/32, purchase snow blower, replace wind tee, and install REIL's on Runway 14.

(b) Chicago - Midway Relievers:

(1) Lewis University Airport, Romeoville

- Airport acquisition-Phase 2
- Overlay western 2,200 feet of Runway 9/27.
- Acquire clear zones and obstruction removal.
- Construct and light partial parallel taxiway.

(2) Lansing Municipal Airport, Lansing

- Construct, light and mark parallel taxiway.
- Improve east-west runway lighting system.
- Construct apron - Phase II and Phase III.

(c) St. Louis - Lambert Relievers:

A system planning grant was issued to the East-West Gateway Council for the purpose of doing a Regional Reliever Airports Study to mitigate capacity constraints at Lambert/St. Louis International Airport. This study was completed in 1988.

(1) St. Louis Regional Airport, East Alton

- Overlay Runway 17/35 and Taxiways B and B-1.
- Update of airport layout plan (ALP).
- Overlay Taxiways 3, 8A, 8B, 8C and 9.
- Expand terminal apron.

(2) Shafer Metro East (privately owned), St. Jacob
A Master Plan has not yet been completed for this airport.

- Overlay runway and taxiway.
- Prepare ALP and Exhibit "A".

(3) St. Louis Downtown Parks, Cahokia

- Relocate approach lights for Runway 12/30 extension.
- Extend Runway 12/30 1500 feet (to 7000 feet).
- Construct north parallel taxiway.
- Overlay Runway 12R/30L.
- Expand terminal apron.

2. Indiana

(a) Chicago - Midway Reliever:

(1) R.G. Hatcher Gary Regional Airport, Gary

- Overlay Runway 12/30.
- Overlay parallel taxiway, Runway 12/30
- Overlay apron.

(b) Indianapolis - International Reliever:

(1) Eagle Creek Airport, Indianapolis

- Construct entrance road.
- Construct apron and associated taxiways.

(2) Greenwood Municipal Airport, Indianapolis (Greenwood)

- Acquire clear zone and development land.
- Construct apron and connecting taxiways.
- Construct new runway and parallel taxiway.

(3) Indianapolis Metropolitan Airport, Indianapolis

- Acquire clear zone and development land.
- Expand apron and construct associated taxiways.
- Construct new entrance road.
- Obstruction removal.

(4) Indianapolis Terry Airport, Indianapolis

- Acquire clear zone and development land.
- Construct new runway.
- Extend Runway 18/36.

(5) Mt. Comfort Airport, Indianapolis

- Acquire development land.
- Expand apron and construct taxiways.
- Construct service road.
- Construct entrance road.

(b) Standiford Reliever:

(1) Clark County Airport, Jeffersonville

- Strengthen parallel taxiway to Runway 18/36
- Strengthen apron.
- Expand apron.

3. Michigan

(a) Detroit-Metro Relievers:

The FAA completed an in-house study of the Detroit area airports in 1988. The study proposed a total of 11 reliever airports for Detroit-Metro Airport. Three of these are new sites that the FAA feels could be developed into airports.

(1) Berz-Macomb Airport, Utica

- Private airport may be acquired by Macomb County.
- Upgrade to general utility standards.

(2) Detroit City Airport, Detroit

This airport is a primary commercial service airport and a proposed reliever for Detroit Metro.

- Master plan update/Part 150 Study underway.
- Land acquisition.

(3) Grosse Ile Municipal Airport, Grosse Ile

- Rehabilitate apron and taxiways.
- Rehabilitate access and service roads.

(4) Livingston County Airport, Howell

- Land acquisition for new runway.
- Construct general aviation apron and taxiways.

(5) Mt. Clemens (New Airport Site), Mt. Clemens
A master planning study is underway.

- Acquire land for new airport or acquire existing private airport.

(6) Monroe-Custer Airport, Monroe

- Acquire clear zone and development land.
- Site work for new 5500 foot runway with ILS.

(7) Oakland-Pontiac Airport, Pontiac

- Master plan update and Part 150 Study (under grant).
- Rehabilitate Runway 9L/27R.
- Rehabilitate and expand apron.
- Rehabilitate taxiways.
- Land acquisition.

- Runway extension 9L-27R.

(8) St. Clair County International Airport, Port Huron

- Precision landing system Runway 5 (under grant).
- Extend crosswind Runway 11-29.

(9) Willow Run Airport, Ypsilanti

- Land acquisition (under grant).
- Rehabilitate and extend Runway 5R/23L.
- Rehabilitate and expand apron.
- Construction of general aviation complex.

(10) New Site Oakland County (Proposed Reliever Site)

- Planning Study scheduled for 1991 for a general utility reliever for Detroit Metro and Oakland-Pontiac Airports.

(11) New Site Washtenaw County (Proposed Reliever Site)

- Master Plan study.

4. Minnesota

(a) Minneapolis-St. Paul International Relievers:

A systems planning grant was issued to the Metropolitan Council for the purpose of doing a Regional Reliever Airports Study to mitigate capacity constraints at Minneapolis-St. Paul International Airport (MSP).

(1) Anoka County-Blaine Airport, Anoka

- Extend Runway 8/26.

(2) Airlake Airport, Lakeville

- Runway 11/29 extension.

(3) St. Paul Downtown-Holman, St. Paul

- Taxiway signage.
- Rehabilitation Runway 8/26 and 12/30
- Distance to go markers for Runway 14/32 and 12/30.

(4) South St. Paul Municipal Airport, South St. Paul

- Taxiway reconstruction.
- Rehabilitation Runway 16/34 MIRL.
- Reconstruct Runway 16/34.
- Apron reconstruction.

5. Ohio

(a) Akron-Canton Reliever:

(1) Akron Fulton, Akron

- Master Plan update underway.
- Construct extension to Runway 1/19.
- Land acquisition.
- Construct parallel taxiway for Runway 1/19.
- Install medium intensity runway lights (MIRL) on Runway 1/19.
- Rehabilitate apron.

(b) Dayton-Cox Reliever:

(1) Dayton General South, Dayton

- Land acquisition and obstruction removal.
- Rehabilitate and extend Runway 9/27.

(c) Greater Cincinnati Relievers:

(1) Hamilton Airport, Hamilton

- Environmental Assessment/Public Hearing.
- Land acquisition and relocation, runway site preparation. Proposed conversion of existing Runway 1/19 to parallel taxiway and construction of new Runway 1/19, offset approximately 400 feet in order to meet transport design standards.

(2) Blue Ash, Cincinnati

- Master Plan update.

(3) Cincinnati Municipal, Lunken Field

- Rehabilitate Runway 2L/20R; rehabilitate lighting for Runway 2R/20L, Taxiways B and C; and overlay Taxiways B.

- Taxiway C rehabilitation and T-hanger site preparation.

- T-hanger taxiways.

(d) Toledo-Express Reliever:

(1) Toledo Metcalf, Toledo

- Master Plan update.

- Rehabilitate Runway and taxiway lighting and electrical vault.

- Construct and light parallel taxiway to Runway 14/32.

- Land Acquisition.

- Reconstruct Runway 14/32 and rehabilitate runway lighting and beacon.

- Extend Runway 14/32.

(e) Port Columbus Relievers:

(1) Rickenbacker, Columbus

- Based on new master plan and ALP, develop areas for cargo, general aviation, navaids, fixed base operator (FBO), install HIRL's, etc.

- Acquire land and soundproof buildings and schools. Construct aprons and taxiways; install CAT II system and construct SRE Building.

- Overlay taxiways, construct taxiways, expand aprons.

(2) Bolton Field, Columbus
A master planning/Part 150 Study is underway.

- Apron expansion.

- Land Acquisition.

- Construct, mark and light cross wind Runway 9/27, including connecting taxiways and rehabilitate Runway 4/22.

- Construct SRE Building, T-hanger Taxiways, fencing and overlay apron and taxiways.

(3) Ohio State University, Columbus

- Master Plan update underway.

- Install guidance signs and relocate fence.

- Construct taxiway from Runway 27L to Runway 27R; construct holding aprons, construct SRE Building, acquire land, construct taxiways, and install AWOS III.

- Rehabilitation of Runway 9R/27Land overlay of taxiways and aprons.

(f) Cleveland-Hopkins Relievers:

(1) Lost Nation, Willoughby

- Master Plan update underway.

- Land acquisition; overlay Runway 23 and install; new MIRL on Runway 5/23. Utility and road relocation; and fencing.

- Land acquisition, overlay Runway 9/27 and utility burial.

- Construct parallel taxiway to Runway 5/23; construct apron and relocate air traffic control tower (ATCT) and Administration Building.

(2) Cuyahoga County, Cleveland

- Expand itinerant apron and apron for general aviation tie-downs; extend Taxiway "D"; rehabilitate taxiway lighting; and land acquisition.

- Construct Runway 23 overrun.

- ARFF access road and SRE.

- Ramp and taxiway extension and drawing improvements.

(3) Lorain County Regional, Elyria/Lorain

- Subject to results of Master Plan/Part 150 Study, implement noise compatibility program measures; construct south taxilane; and land acquisition.
- Land acquisition, AWOS installation and obstruction removal.
- Taxiway extension, overlay and lighting rehabilitation.
- EIS preparation for Runway extension.

(4) Freedom Field, Medina

- Master Plan underway.
- Extend and reconstruct taxiway.
- Overlay and widen Runway 18/36 and install VADI's
- Construct taxiways ramp.

6. Wisconsin

(a) General-Mitchell Field Relievers:

(1) Kenosha Municipal, Kenosha

- Extend Runway end 14 and reconstruct Runway 14-32.
- Install ILS.

(2) Horlick-Racine, Racine

- Land acquisition.
- Rehabilitate Runway 4-22.
- Obstruction removal.
- Develop terminal area.

(3) Waukesha County, Waukesha

- Land acquisition.
- Extend Runway 10/28.
- Install ILS/MALSR.

- Reconstruct existing Runway 10/28 and construct new parallel taxiway. Install new lights and vault.

(4) Capitol Drive Airport (Privately Owned), Brookfield

- Land acquisition.
- Construct taxiway and apron.
- Obstruction removal.

(5) Morey Airport (Privately owned), Middleton

- Master Plan.

CHAPTER 14. FLIGHT SAFETY

Flight Standards is undergoing major changes as a result of the Airline Deregulation Act of 1978. Recent assessments of the FAA's role in both the air carrier and general aviation industries have identified several areas where emphasis should be placed to meet the FAA goal of aviation safety.

The following sections are contained in this chapter:

a. Flight Standards Staffing

b. National Aviation Safety Inspection Program

c. Airport Site Visit Program

d. Accident Prevention

a. Flight Standards Staffing

Description/Purpose

To implement the recommendations of the Project SAFE Job Task Analysis; increase staffing of the Flight Standards work force to meet the demands of the aviation industry resulting from deregulation.

Accomplishments (January 1, 1986-December 31, 1986)

The Job Task Analysis provided task and time data for aviation safety inspection functions. This allowed a new staffing standard to be written which reflected national work program guidelines. Application of that standard to the present work environment reveals a need for approximately 1100 additional Aviation Safety Inspectors (ASI's) and 352 support staff positions nationwide.

In the Great Lakes Region, FY-87 saw ASI/support position authorizations increase from 315 to 344.

Schedule of Events

Project SAFE projections show Great Lakes Region staffing increases to continue over the next four years. A gradual program of hiring will coordinate such areas as employee selection, placement, and training for better employee assimilation into the work force.

Year	Inspectors	Support	Total
FY-88	26	6	32
FY-89	44	11	55
FY-90	36	12	58
FY-91	30	12	51
Totals:	136	41	177

Impact on Aviation Users

- Increased staffing will result in increased surveillance. The aviation industry will see a greater FAA presence.

- Increased staffing will result in quicker responses to the needs of the aviation community.

Related National Plans

Project SAFE.
Human Resource Management

b. **National Aviation Safety Inspection Program**

Description/Purpose

A nationally directed program of inspections to provide sufficient information for the FAA to constantly assess the safety status of the aviation industry.

Accomplishments (January 1, 1986-December 31, 1986)

Aviation Safety Inspectors from the Great Lakes Region participated in 8 national inspections. Also, 3 Great Lakes based air carriers were inspected under the national program.

Schedule of Events

There are 8 inspections scheduled for the Great Lakes Region under the national program in 1987.

Impact on Aviation Users

Regionally-based carriers and repair agencies will come under closer scrutiny.

Related National Plans

Project SAFE.

c. **Airport Site Visit Program**

Description and Purpose

As a supplement to the Flight Standards field office, airport surveillance and evaluation effort described in Order 8440.5A, the Flight Procedures Branch plans to visit each non-Part 139 instrumented airport with runways of 3500 feet or greater. There are approximately 275 airports of this type within the Great Lakes Region. Visits are scheduled to each airport at least once each three years. The responsible Airport District Office is invited to participate in both the site selection and site visit. Advance coordination is made with the airport sponsor/manager. The airport site visit includes:

1) Evaluation of instrument approach procedure flyability
2) Review of charted/published information
3) Review airport marking and lighting
4) Obstruction identification
5) Discussion of methods to improve minima and safety with airport manager

Accomplishments (October 1, 1985-September 30, 1986)

In FY-1986, the region visited 104 airports.

Schedule of Events

In FY-1987 (October 1, 1986-September 30, 1987), the region plans to visit 107 airports.

Coordination

The Flight Standards Division lead office is the Flight Procedures Branch, AGL-220, (312) 694-7255.

Impact on Aviation Users

Provide a medium for airport sponsors/managers to obtain a better understanding of FAA objectives in providing a safe aeronautical environment.

Reduce accidents/incidents rates.

Allows FAA to gain first hand knowledge of an instrumented airport environment and make necessary adjustments to instrument operations.

d. Accident Prevention

Description and Purpose

Accident Prevention Specialists throughout the Region conduct "Safety Seminars" which are designed to inform and educate general aviation airmen on current aviation safety matters.

Accomplishments (January 1, 1988-December 31, 1988)

In 1988, the Region conducted 614 safety seminars with 47,330 pilots in attendance.

Schedule of Events

The Public Affairs office assists in providing safety data to pilots. Safety information is supplied by the Regional Accident Prevention Coordinator. News Releases are made to selected media when appropriate. Flight Standards District Offices announce scheduled safety seminars by letter to all airmen registered within the area of the planned meeting. Meetings are often co-sponsored by aviation orientated organizations that also promote aviation safety.

Coordination

The lead office for the accident prevention program is the Flight Standards Division, Operations Branch, Accident Prevention Coordinator, AGL-262, (312) 694-7155.

The lead office for the aviation safety news releases is the Public Affairs Office, AGL-5, (312) 694-7430.

Impact on Aviation Users

Increased communications between aviation pilots and FAA aviation safety inspectors.

Reduce accident rates.

Schedule of Events

In FY-1988 (October, 1987 - September 30, 1988), the Region plans to continue conducting approximately the same number of safety seminars. Subject material will be based on results of incident/accident analysis, and the aviation communities desires.

Coordination

The lead office for the accident prevention program is the Flight Standards Division, Operations Branch, Accident Prevention Coordinator, AGL-266, (312) 694-7152.

The lead office for the aviation safety news releases is the Aviation Information Division, AGL-5, (312) 694-7430.

Impact on Aviation Users

Increased communications between aviation pilots and FAA aviation safety inspectors.

Reduce accident rates.

a. Listening Sessions

Description and Purpose

Each year meetings are held with various aviation user groups to discuss topics of mutual interest. The primary method for reaching general aviation pilots is through Aviation User-FAA Forums (formerly called Listening Sessions). The Region is represented by the Regional Administrator, division managers, and FAA facility managers from the local area. Forums are usually held in conjunction with safety seminars to insure a broad representation of aviation interests. Forums generally result in a lively question and answer exchange.

Contact between air carrier officials and regional managers on specific matters of day-to-day concern is also an ongoing activity. On a less frequent basis, the Regional Administrator and other FAA managers meet with airline officials to discuss future plans, requirements, and expectations.

Accomplishments (January 1, 1988-December 31, 1988)

In 1988, Aviation Forums were held at Rochester, Minnesota; Fargo, North Dakota; Columbus, Ohio; and Lansing, Michigan.

A listening session with air carriers serving the region was held in July 1988.

Passenger listening sessions were held at Duluth, Minnesota; Milwaukee, Wisconsin; Columbus, Ohio; and Rochester, Minnesota.

Schedule of Events

The Region will hold five Aviation User-FAA Forums with the aviation community each year. In FY-90, forums will be held at: Dayton, Ohio; Indianapolis, Indiana; Flint, Michigan; Duluth, Minnesota; and Grand Forks, North Dakota. Dates for FY-90 listening sessions will be established during the first quarter of FY-90.

Coordination

The lead office for arranging listenig sessions is the Aviation Information Division AGL-5, (312) 6947111.

Impact on Aviation Users

Improved communication between users of the NAS and regional managers leading to resolution of problem areas and misconceptions.

b. **State Agencies**

Description and Purpose

A conference is held each fall with state aviation directors to discuss topics of mutual interest. Meetings between the FAA Regional Administrator and the individual state agencies occur on a regular basis.

Accomplishments (January 1, 1988-December 31, 1988)

A meeting of State Aviation Directors was hosted by the region in October 1988 in Chicago.

FAA-state meetings were held in Michigan, Ohio, Minnesota, and Illinois.

Schedule of Events

Meetings with the state aviation directors will continue to be held annually in October at the FAA Regional Office. Meetings with the individual states will be held at a rate of one state per quarter.

Coordination

The lead office for arranging meetings with the state aviation directors is the Aviation Information Division AGL-5, (312) 694-7111.

Impact on Aviation Users

Improved communications between state aviation agencies and the FAA leading to resolution of problem areas.

c. **Aviation Education**

Description and Purpose

The Aviation Education program seeks to assure a technically qualified work force for the aviation industry through the following avenues:

1. Encouraging aviation career programs throughout the school system.

2. Acquainting young people with the career potentials in the air transportation field.

3. Increasing public awareness of the role air transportation plays in improving the economic and social life of all Americans.

Coordination

The lead office for organizing the Aviation Education Program is the Aviation Information Division AGL-5, (312) 694-7042.

CHAPTER 16. ADMINISTRATIVE

a. Disadvantaged Business Enterprise Program

Description and Purpose

Department of Transportation (DOT) regulations require recipients of FAA grants to develop a Disadvantaged Business Enterprise (DBE) Program for increasing the participation of minority, women, and disadvantaged business enterprises (M/W/DBE) in FAA-funded contracts and in leasing opportunities at airports. The DBE Programs must be approved by the regional FAA Civil Rights Staff.

The current grant program, known as the Airport Improvement Program (AIP), was established by the Airport and Airway Improvement Act of 1982. The Act of 1982 was recently amended by the Airport and Airway Safety and Capacity Act of 1987. Under this amendment, certain AIP grants awarded after January 1988 subject recipients to Subpart D of Departmental regulation 49 CFR Part 23. Subpart D requires recipients to set a minimum overall DBE goal of 10 percent for FAA-funded contracts or provide a special justification to request approval of a goal less than 10 percent. In accordance with Subpart A, recipients must continue to submit separate MBE and WBE goals for concession opportunities at airports.

Accomplishments (January 1, 1988 - December 31, 1988)

1. A regional M/W/DBE seminar was held on March 23 and 24, 1988 in Detroit, Michigan. The seminar focused on aviation contract opportunities for M/W/DBE's. About 250 persons attended the seminar including M/W/DBE's; airport sponsors; local, state, and federal government representatives; and non-minority firms interested in contracting with M/W/DBE's. The seminar was co-sponsored by the FAA, Great Lakes Region, Wayne County, and the Michigan Bureau of Aeronautics.

2. The M/W/DBE Seminar in Detroit featured workshops on airport concession opportunities at Chicago, Illinois; Cleveland, Ohio; Detroit, Michigan; and Milwaukee, Wisconsin. In addition, a workshop was held on starting an airport concession at a major airport which included representatives from the FAA, Kent County, Host International, and an MBE.

3. On-site compliance reviews were not conducted during 1988 to allow recipients time to revise their MBE Program to a DBE Program and institute the new requirements of Subpart D.

Schedule of Events

1. Hold an annual conference in a major city in the region, bringing together M/W/DBE's, grant recipients, prime contractors, and other DOT elements to provide information about financial assistance programs, business development strategies, and DOT-funded contract opportunities.

2. Assist grant recipients in increasing opportunities for MBE's and WBE's in airport concessions during 1989.

3. Conduct two on-site compliance reviews of primary airport grant recipients during 1989.

Coordination

The lead office for these programs is the Civil Rights Staff, (312) 694-7209.

Related National Plans

Agency Implementation Plan for Public Programs

Related Sections of Regional Plan

None

b. Internal Control Reviews

Description and Purpose

The Congress enacted the Federal Managers' Financial Integrity Act (FMFIA) in September, 1982 in response to continued disclosures of fraud, waste and abuse across a wide spectrum of Government operations. The FMFIA strengthened the existing requirements of the Accounting and Auditing Act of 1950. The goal of the FMFIA is to improve the management of federal operations by strengthening internal control and accounting systems. Specifically, the Act requires that agency heads annually report to the President and the Congress whether their internal control systems:

- comply with the Controller General's internal control standards, and

- provide reasonable assurance that:

  -- obligations and costs are in compliance with applicable laws,

  -- funds, property, and other assets are safeguarded, and

  -- revenues and expenditures are properly recorded and accounted for.

Accomplishments (January 1, 1988 - December 31, 1988)

Risk assessments were conducted on 23 regional programs/functions. The following inherent risk ratings were assigned:

High Risk	1
Medium Risk	16
Low Risk	6

An Internal Control Review was initiated on the Regional Travel Management function.

Schedule of Events

The Internal Control Review on Travel Management is scheduled for completion in March, 1989.

In FY-90, Management Systems Division will identify and conduct another ICR on an administrative program.

Coordination

The Management Systems Division, AGL-60 is the regional office coordinator. All straightlined program managers conduct and report internal control activities directly to their respective headquarters program counterparts but ensure the Regional Administrator is kept informed through the coordinator.

c. Appraisal of Regional Programs

Description and Purpose

An appraisal is a review of a program/function/activity. The Regional Administrator determines the review objectives some of which could include one or more of the following:

- Whether applicable laws, regulations, and directives are being complied with.

- Whether resources are managed or used in an economical and efficient manner.

- Whether the desired results, objectives, or benefits of a program/function/activity are being achieved.

Accomplishments (January 1, 1988 - December 31, 1988)

In June, 1988 an appraisal of the Region's airspace proposal review process was completed. The appraisal concluded that the process could be improved. Specific recommendations for collecting and reporting information were suggested. The Regional Administrator increased emphasis to the airspace reviews by including them in the Regional Management Information System.

The Region led the development of the national guidance to establish the new Regional Administrators' appraisal responsibilities under the Agency reorganization.

Schedule of Events

During FY-89 Regional guidance will be revised and a program area identified for review.

Coordination

The Management Systems Division, AGL-60 performs appraisals on behalf of the Regional Administrator.

CHAPTER 17. RESOURCE MANAGEMENT SUMMARY

Based on implementing the programs shown in this plan, Regional permanent on-board staffing and financial resources are expected to change as follows:

	Full Time Permanent On-Board Staffing*	Budget (000) Operations	F&E	AIP	TOTAL
FY-88	6,573	$358,190	$19,115	$115,279	$492,584
FY-89E	6,568	$385,327	$41,400	$170,000	$596,727
% Change	-	7.6%	116.6%	47.5%	21.4%

It is expected that Regional full-time permanent on-board staffing will be relatively constant in the FY-88 and FY-89 time frame.

* All appropriations
E Estimate

CHAPTER 18. SUMMARY OF ACCOMPLISHMENTS

This chapter summarizes and highlights key regional accomplishments during the time period of January 1, 1988, through December 31, 1988 (unless otherwise noted). The accomplishments are organized according to the chapter of the Regional Plan from which the information was taken.

1. The Current Aviation System - Chapter 2. During the 1988, key regional aviation statistics changed (as measured against 1987) as follows:

   a. The number of center operations increased by 5%.

   b. The number of operations at airports with FAA air traffic control towers increased by 2%.

   c. The number of services at flight service stations was down 6%.

   d. The number of Part 139 airports decreased from 127 to 119.

   e. The number of domestic air carrier certificates remained unchanged at 8.

   f. The number of check airmen increased from 575 to 1,116.

2. Human Resource Management - Chapter 3.

   a. The Employee assistance Program provided services to 457 clients in FY88.

   b. Conducted 4 MTA Phase II seminars (34 employees).

   c. Conducted 2 Secretarial Grid seminars for 46 employees.

   d. Conducted 1 Advanced Comms. Workshop

   e. Conducted MITTS workshops for 61 employees.

   f. Conducted 1 SFA Facilitator Training course for 24 employees.

3. Enroute Systems - Chapter 4.

   a. The Indianapolis Center was resectored to accommodate the transfer of airspace from Atlanta Center.

   b. The Minneapolis center added one high altitude sector.

   c. The Cleveland Center added one high altitude sector.

   d. Much preplanning occurred for the additional ARTCC administrative space.

   e. An equipment summary for a "mock" ACF backup plan was formulated.

f. Interim FDIO operation was implemented between all ARTCC's and 36 terminal facilities.

g. Phase 2, Stage 1 TMS equipment delivered to the ARTCC's. Chicago ARTCC implemented Aircraft Situation Display (ASD).

4. Terminal Systems - Chapter 5.

a. ARTS IIA installed at Peoria.

b. The new Cleveland tower was commissioned.

c. The tower cab was modernized at Detroit City.

d. A contract tower was established at Waukegan, Illinois.

e. The Aircraft Situation Display was installed at O'Hare.

5. Flight Service Station Systems - Chapter 6.

a. Color weather graphic systems were installed at all nine AFSS's.

b. Radar Remote Weather Displays were installed at the Chicago, Minneapolis, Cleveland and Terre Haute AFSS's.

c. Lunken, Decatur, Zanesville, Wausau, LaCrosse, Saginaw, Traverse City, Jackson, Jamestown, and Dickenson FSS's were closed.

6. Communications System - Chapter 7.

a. ICSS was installed at Detroit City and Cleveland Hopkins towers.

b. NADIN IA was commissioned.

c. Communication networks were completed at the Minneapolis and Cleveland Centers.

7. Navigation and Landing Systems - Chapter 8.

a. Loran-C approach procedures were developed for the Ohio State, Kalamazoo, and Blue Ash airports.

b. Seven VASI's and eight REILS's were installed.

c. An ILS was commissioned at Waukegan, IL (RW23) and Minneapolis - St. Paul International Airport (RW11L).

8. Surveillance Systems - Chapter 9.

a. Design work was completed for the Toledo and Madison ASR 9 sites.

9. Weather Systems - Chapter 10.

a. Low Level Windshear Alert System (LLWAS) enhancements at O'Hare, Detroit Metro, Indianapolis, Minneapolis, Milwaukee, Cleveland, Columbus, and Dayton.

10. Maintenance and Operations Support Systems - Chapter 11.

a. Reroofed 21 VOR facilities.

11. Information Resources Management - Chapter 12.

a. The maximum/minimum equipment list system was installed.

b. The Airport Grant Tracking system was installed.

12. Airports - Chapter 13.

a. Approved $225.6 million under 215 Airport Improvement Program (AIP) grants in FY-88.

b. Placed under grant 5 new runways and completed construction of 6 new runways.

c. Runway extensions are under grant at 9 airports. Runway extensions were complete at 20 airports.

d. Part 150 Noise Compatibility Studies were approved at 5 airports, studies are underway at 27 airports. Studies are being discussed at 8 airports.

e. Projects to develop heliport system plans are underway in 3 states.

f. Acquisition of two private airports by public bodies.

g. Establishment of 2 new public use airports.

h. The Detroit Airport Capacity Enhancement Task Force completed its technical studies. The final report was issued May 12, 1988.

13. Flight Safety - Chapter 14

a. Seven air carriers based in this region were inspected under the National Aviation Safety Inspection Program. Regional flight standards personnel participated on 41 national inspection teams.

b. 66 non-Part 139 airports with instrument approaches were evaluated for safety considerations.

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c. The region conducted 614 safety seminars with 47,330 pilots in attendance.

d. The number of regional Flight Standards personnel increased from 340 to 359.

14. External Relations - Chapter 15

a. Met with representatives of the airlines serving in the region.

b. Met with the State Aviation Directors.

c. Held five Aviation Forums with general aviation pilots.

d. Held three Passenger Listening Sessions.

15. Administrative - Chapter 16

a. Internal control reviews were conducted 23 programs/functions.

b. An appraisal was made of the airspace proposal review process.

c. A regional Minority/Women/Disadvantaged Business Enterprise seminar was held in Detroit.

APPENDIX A

GLOSSARY OF ACRONYMS

AAC	FAA Aeronautical Center
AAP	advanced automation program
AAS	advanced automation system
ABDIS	class A interim NADIN computerized BDIS terminal at Kansas City ARTCC and NATCOM
ACE	FAA Central Region
ACF	area control facility
ADO	Airport District Office
ADP	automated data processing
AERA	automated flight service station
AES	activity and environment systems
AF	Airway Facilities
AFSS	automated flight service station
AFTN	aeronautical fixed telecommunications network
A/G	air-to-ground
AGL	FAA Great Lakes Region
AGL	above ground level
AIP	Airport Improvement Program
AIRMET	airmen's meterological information
AIS	aeronautical information system
ALS	approach lighting system
ALSF	approach lighting system with sequence flasher
AOS	agency operations system
APS	Airway Planning Standard
ARO	Rotorcraft Program Office
ARF	Airport Reservation Function
ARINC	Aeronautical Radio, Inc.
ARMS	Airport Remote Monitoring System
ARSR	air route surveillance radar
ARTCC	air route traffic control center
ARTS	automated radar terminal system
ASAS	aviation safety analysis system
ASD	aircraft situation display
ASDE	airport surface detection equipment
ASI	aviation safety inspector
ASR	airport surveillance radar
AT	Air Traffic
ATA	Air Transport Association of America
ATARS	automatic traffic advisory and resolution service
ATC	air traffic control
ATCBI	air traffic control beacon interrogator
ATCC	air traffic control command center
ATCRBS	air traffic control radar beacon system
ATCT	airport traffic control tower
ATIS	automatic terminal information service

ALSIP	approach lighting system improvement program
AWANS	aviation weather and NOTAM system
AWOS	automated weather observing system
AWP	aviation weather processor
BDIS	automatic data interchange system, service B
bps	bits per second
BRITE	bright radar indicator terminal equipment
BUEC	backup emergency communications
CA	conflict alert
CARF	Central Altitude Reservation Function
CBI	computer based instruction
CCD	consolidated cab display
CCP	contingency command post
CD	common digitizer
CERAP	combined center radar approach control
CFCF	Central Flow Control Function
CFWP	central flow weather processor
CFWSU	central flow weather service unit
CM	commercial service and other than primary service
CNS	consolidated NOTAM system
CR	commercial service and reliever airport
COMLO	compass locator
COMSEC	communications security
CONUS	continental, contiguous, or conterminous United States
CRF	central repair facility
ELLWAS	Enhanced Low-Level Windshear Alert System.
AUTODIN	automatic defense information network
CRT	cathode-ray tube
CWP	central weather processor
CWSU	center weather service unit
CY	calendar year
DABS	discrete address beacon system
DBE	disadvantage business enterprises
DBRITE	digital bright radar indicator terminal equipment
DC	direct current
DES	data encryption standard
DF	direction finder
DME	distance measuring equipment
DME/P	precision distance measuring equipment
DOD	Department of Defense
DOT	Department of Transportation
DSB	double-standard
DS&S	director's staff and support
DUAT	direct users access terminal
DVOR	Doppler very high frequency omnidirectional range
EAA	Experimental Aircraft Association
EARTS	en route automated radar tracking system
E-DARC	enhanced direct access radar channel
EFAS	en route flight advisory service

EMC	electromagnetic compatibility
EPA	Environmental Protection Agency
ERL	Environmental Research Laboratories
ERM	en route metering
ETABS	electronic tabular display system
ETG	enhanced target generator
FAA	Federal Aviation Adminstration
FBO	fixed base operator
FDEP	flight data entry and printout
FDIO	flight data input/output
F&E	facilities and equipment
F,E&D	facilities, engineering, and development
FIR	flight information region
FM	frequency modulation
FPS	military primary radar
FSAS	flight service automation system
FSDPS	flight service data processing system
FSP	flight strip printer
FSS	flight service station
FSTN	federal secure telephone network
FWCS	flight watch control station
FY	fiscal year
GA	general aviation
GFE	government furnished equipment
GOES	geostationary operational environmental satellite
GPO/GPI	general purpose output/general purpose input
GPS	global positioning system
GSA	General Services Administration
GSL	general support laboratory
H	homing radio beacon
HH	homing radio beacon high power
HF	high freqeuncy
HIWAS	hazardous in-flight weather advisory service
HR	human relations
HRM	human resource management
HUD	head-up display
HVAC	heating, ventilating, and air-conditioning
IBM	International Business Machines
ICAO	International Civil Aviation Organization
ICSS	integrated communications switching
IFM	integrated flow management
IFR	instrument flight rules
ILS	instrument landing system
IRMP	Information Resources Management Plan
IVRS	interim voice response system
JAWS	joint airport weather studies
JSS	joint surveillance system

kHz	kilohertz
kW	kilowatt
kWh	kilowatthour
LLWAS	low level wind shear alert system
LRU	lowest replaceable unit
MALSR	medium-intensity approach lighting sytem with runway alignment indicator lights
MAR	minimally attended radar
MBE	minority business enterprises
MCC	maintenance control center
MED	manual entry device
MHz	megahertz
MIS	management information system
MMS	maintenance management system
Mode C	altitude reporting mode of secondary radar
Mode S	discrete addressable secondary radar
modem	modulator-demodulator
MOS	metal-oxide semiconductor
MPS	maintenance processor subsystem
MSAW	minimum safe altitude warning
MSL	mean sea level
NADIN	National Data Interchange Network
NAR	National Airspace Review
NARACS	national radio communications system
NAS	National Airspace System
NASA	National Aeronautics and Space Administration
NASNET	national airspace system network
NASP	National Airspace Sytem Plan
NATCOM	National Communications Center, Kansas City, Missouri
NAVAID	navigational aid
NDB	nondirectional beacon
NEXRAD	next generation weather radar
NICS	NAS interfacility communications system
NMC	National Oceanic and Atmospheric Administration
NOAA	National Oceanic and Atmospheric Administration
NP	nonprecision ZFR procedure
NPIAS	National Plan of Integrated System
NSSF	NAS Simulation Support Facility
	Information Agency
NTSB	National Transportation Safety Board
NWS	National Weather Service
ODALS	omnidirectional approach lighting system
ODAPS	oceanic display and planning system

OE/AAA	obstruction evaluation and airport analysis
OMB	Office of Management and Budget
OPM	Office of Personnel Management
ORD	operational readiness demonstration
OSHA	Occupational Safety and Health Administration
PAPI	precision approach path indicator
PATWAS	pilots automatic telephone weather answering service
pcb	printed circuit board
PCS	power conditioning system
PIREP	pilot report
ppi	plan position indicator
PR	primary service airport
pf	pulse repetition frequency
PROFS	program for regional observing and forecasting
PVD	plan view display
RADS	radar alphanumeric display system
RAIL	runway alignment indicator lights
RCAG	remote center air/ground communications facility
RCCC	regional communication control center
RCE	remote control equipment
RCF	remote control facility
RCO	remote communications outlet
RFP	request for proposal
RL	reliever airport or helicopter
RML	radar microwave link
RMM	remote maintenance monitoring
RMMS	remote maintenance monitoring system
RMS	remote maintenance subsystem
RRWDS	radar remote weather display system
RTR	remote transmitter/receiver
RVV	runway visibility value
SAR	system analysis recorder
SARMS	Small Airport Remote Monitoring System
SEIC	System Engineering Integration Contractor
SET	system embedded training
SFO	Sector Field Office
SIAP	standard instrument approach procedure
SIGMET	significant meteorological information
SIGMET	significant meteorological information
SSALF	simplified short approach light facility
SSALR	simplified short approach lighting system with runway alignment indicator lights
SSALS	simplified short approach light system
SSB	single sideband

R&D	research and development
REIL	runway-end identification lights
SSL	system support laboratory
SSR	secondary surveillance radar
STEP	service test and evaluation program
STU II	secured telecommunications voice network, Model II
TACAN	tactical air navigation
TCAS	traffic alert and collision avoidance system
TCS	tower communications system
T&E	test and evaluation
TELCO	telephone company
TIDS	terminal information display system
TML	television microwave link
TPX	military beacon decoder
TRACAB	terminal radar approach control in the tower cab
TRACON	terminal radar approach control
TSC	DOT Transportation System Center
TSSF	terminal system support facility
TV	television
TWEB	transcribed weather broadcast
UHF	ultra high frequency
UPS	uninterrupted power source
USAF	United States Air Force
VASI	visual approach slope indicator
VAX	virtual address extension-series of 32-bit equipment manufactured by Digital EquipmentCorporation
SSF	system support facility
VFR	visual flight rules
VHF	very high frequency
VLF	very low frequency
VOR	VHF omnidirectional range
VORTAC	VOR co-located with TACAN
VOT	VHF omnidirectional range test
VRS	voice response system
VSCS	voice switching and control system
WCP	weather communications processor
WBE	women business enterprises
WMSC	weather message switching center
WSR	weather service radar
Wx	weather

APPENDIX B

GREAT LAKES REGIONAL SHUTDOWN SCHEDULE

MAY 1989

CITY	STATE	AIRPORT	RUNWAY ID	FACILITY	SHUTDOWN DECOMM.	RESTORE COMMISSION	MESSAGE OFFICE	PLT CK	REMARKS
ALTON	IL		29	ILS	06-01-89	12-01-89	CHI-ADO	YES	DISPL THRSHD,MALSF TO MALSR, LOC,ON, STILL ON
BEMIDJI	MN			BJI VORTAC	08-21-89	10-06-89	AGL-433	YES	REPLACE ROOF
BISMARCK	ND			BIS VOR/DMER	05-15-89	06-10-89	AGL-433	NO	REPAIR ROOF
BLOOMINGTON	IN	MONROE CO.		BMG VOR	08-28-89	10-11-89	AGL-433	YES	REPLACE ROOF
CHICAGO	IL	O'HARE	27L	SSALR	07-15-89	11-16-89	AGL-450	YES	CHANGE SSALR TO MALSR, MM DOWN 8/13—11/16
CHICAGO	IL	O'HARE		VOR	05-09-89	06-20-89	AGL-450	YES	NEW ANTENNA, DME DOWN TWO DAYS
CHICAGO HEIGHTS	IL			VOR	07-15-89	11-15-89	AGL-450	YES	CONVERT TO DOPPLER
COLUMBUS	OH	OHIO STATE	9L/27R	OSU	05-15-89	05-30-89	AGL-670	NO	OVERLAY
COOPERSVILLE	MI			ARSR	———	09-05-89	AGL-450	YES	ESTABLISH FPS-67
DAYTON	OH	DAYTON INT'L	6L/24R	DAY ILS	08-01-89	11-30-89	AGL-450	YES	EXTEND 24R-GS, MM, LOC, MALSR AFFECTED
DECATUR	IL			DEC VORTAC	08-28-89	10-11-89	AGL-433	YES	REPLACE ROOF
DEKALB	IL	MUNICIPAL	27	DKB ILS	05-01-89	07-15-89	CHI-ADO	NO	DISPLACE THRESHOLD FOR R/W EXTENSION
DETROIT	MI	METRO		DTW VOR	———	07-27-89	AGL-450	YES	RELOCATE FROM WILLOW RUN
DETROIT	MI	CITY		DET NDB	04-10-89	06-10-89	AGL-450	YES	ESTABLISH NDB
DICKINSON	ND			DIK VORTAC	06-12-89	07-28-89	AGL-433	YES	REPLACE ROOF
DRYER (ELYRIA)	OH			DJB VORTAC	06-12-89	07-28-89	AGL-433	YES	REPLACE ROOF
EFFINGHAM	IL		1/19		05-01-89	07-15-89	CHI-ADO	NO	RNWY OVERLAY
FAIRMONT	MN			FRM VOR/DME	04-17-89	05-30-89	AGL-433	YES	REPLACE ROOF

CITY	STATE	AIRPORT	RUNWAY ID	FACILITY	SHUTDOWN DECOMM.	RESTORE COMM.	MESSAGE OFFICE	FLT CK	REMARKS
FAIRMONT	MN		13/31		07-24-89	08-01-89	MSP-ADO	NO	OVERLAY
FARGO	ND		35	FAR MALSR	06-01-89	09-01-89	AGL-450	YES	AIR GUARD TRIP WILL COINCIDE
FARGO	ND			FAR VORTAC	07-03-89	08-16-89	AGL-433	YES	REPLACE ROOF
FINDLAY	OH			ANOS		09-21-89			COMMISSIONING
FLYING CLOUD	MN	FLYING CLOUD	ALL		06-05-89	07-30-89	LOCAL	NO	INTERMITTENT FOR CRACK SEALING
FORT WAYNE	IN	BAER FIELD	14/32	FWA ILS	04-15-89	11-15-89	AGL-450	YES	GS RVR, RUNWAY CLOSED NOW
GRAND FORKS	ND		26	GFK REIL	———	08-01-89	AGL-450	NO	ESTABLISH REIL
HIBBING	MN			HIB VOR/DME	07-03-89	08-16-89	AGL-433	YES	REPLACE ROOF
HURON	SD			HON VORTAC	09-01-89	10-15-89	AGL-433	YES	REPLACE ROOF
INDIANAPOLIS	IN	INT'L	22R/4L	UZK MALSR	09-01-89	10-01-89	AGL-450	NO	ADD THRESHOLD LIGHTS 4L-GS, LOC, MALSR OFF
INDIANAPOLIS	IN	INT'L		VHP VORTAC	07-03-89	08-16-89	AGL-433	YES	REPLACE ROOF
KANKAKEE	IL		16/34		09-06-88	05-01-89	AIP/433		EXTEND 34 END-1200'—R/W OPEN FOR THE WINTER
KEELER	MI			ELX VORTAC	05-15-89	06-28-89	AGL-433	YES	REPLACE ROOF
KENT	OH		01/19	IG3 VASI	06-30-89	11-30-89	AIP-433		DELAYS IN COMPLETION
KOKOMO	IN			AWOS		08-24-89			COMMISSIONING
LANSING	IL		27	VASI	09-05-88	06-01-89	AIP/433	YES	EXTEND R/W,—R/W OPEN FOR THE WINTER
LANSING	MI			LAN VORTAC	06-27-89	08-11-89	AGL-433	YES	REPLACE ROOF-#56089
LONE ROCK	WI			LNR VORTAC	08-08-89	09-21-89	AGL-433	YES	REPLACE ROOF-DATES CHANGED TO AVOID FLY-IN
MANSFIELD	OH		23	MFD REIL	———	08-01-89	AGL-450	NO	ESTABLISH REILS RNWY 23 & PAPI ON 5
MINNEAPOLIS	MN		4/22	MSP RUNWAY	03-20-89	06-01-89	AIP-433		RECONSTRUCT RUNWAY

CITY	STATE	AIRPORT	RUNWAY ID	FACILITY	SHUTDOWN DECOMM.	RESTORE COMMISSION	MESSAGE OFFICE	FLT CK	REMARKS
MT. HAWLEY	IL		17/35		04-01-89	06-30-89	AIP/433		RWY DISPLACED FOR EXTENSION WORK
MT. VERNON	IL			AWOS		08-24-89			COMMISSIONING
NODINE	MN			ODI VORTAC	09-15-89	10-28-89	AGL-433	YES	REPLACE ROOF
PEKIN	IL		9/27		05-15-89	09-15-89	CHI-ADO	NO	OVERLAY
PELLSTON	MI			PLN VORTAC	08-28-89	10-11-89	AGL-433	YES	REPLACE ROOF
PEORIA	IL	GREATER PEORIA	31	SEVERAL	07-01-88	09-01-89	AIP/433		
PHILIP	SD			PHP VOR/DME	08-21-89	10-05-89	AGL-433	YES	REPLACE ROOF
PIERRE	SD			PIR VORTAC	06-26-89	08-09-89	AGL-433	YES	REPLACE ROOF
PULLMAN	MI			PMM VORTAC	08-01-89	09-14-89	AGL-433	YES	REPLACE ROOF
QUINCY	IL			AWOS		08-24-89			COMMISSIONING
RAPID CITY	SD		32	RAP MALSR	08-01-89	09-01-89	AGL-450	NO	ADD THRESHOLD LIGHTS, ENGR. DELAYS
REDWOOD FALLS	MN			RWF VORTAC	06-12-89	06-30-89	AGL-433	NO	REPAIR ROOF
ROBINSON	IL		09-27		11-01-88	03-01-89	AIP/433		INSTALL MIRL
SAGINAW	MI	FREELAND		MBS MALSR	06-01-89	09-01-89	AGL-450	YES	REPLACE SSALR WITH MALSR
SIOUX FALLS	SD			FSD VORTAC	08-14-89	08-31-89	AGL-433	NO	REPAIR ROOF
SIOUX FALLS	SD	JOE FOSS	RNWY 1		06-15-89	07-01-89	AGL-450	NO	INSTALL THRESHOLD 'T' BAR
ST. PAUL	MN	DOWNTOWN	14/32		05-01-89	05-07-89	MSP-ADO	NO	REMARKING
STERLING	IL			AWOS		07-27-89			COMMISSIONING
TERRE HAUTE	IN			HUF VASI,REIL	03-20-89	06-20-89		YES	INDAFS TXWY CONST.
TIVERTON	OH			TVT VOR	04-17-89	04-28-89	AGL-433	YES	REPLACE GRD-CHECK BRIDGE AND ADD DME
TROY	IL			TOY VORTAC	05-15-89	09-15-89	AGL-450	YES	CONVERT TO DOPPLER
WISCONSIN RAPIDS	WI		02	ISW PAPI	———	09-01-89	AGL-450	NO	ESTABLISH PAPIS RNWY-2-29-20
ZANESVILLE	OH			ZZU VOR/DMER	05-09-89	05-11-89	CHI-AFS	NO	NEW DME ANTENNA

APPENDIX C

PROPOSED NON-FEDERAL ESTABLISHMENTS

AIRPORT	STA FACILITY TE	COMM. DATE	STATUS
GRAND FORKS	N.D NDB	UNKNOWN	CONSTRUC APPROV 3/28/88
BELLE FOURCHE	S.D NDB	UNKNOWN	AIRSPACE RESPONSE 4/18/89
HOVEN	S.D NDB	UNKNOWN	FEASIBILITY 3/31/88
REDFIELD	S.D NDB	UNKNOWN	AWAITING JUSTIFICATION
SISSETON	S.D NDB	UNKNOWN	AWAITING JUSTIFICATION
SPEARFISH	S.D NDB	UNKNOWN	CONSTRUC APPROV 1/30/89
VERMILLION	S.D NDB	UNKNOWN	CONSTRUC APPROV 12/22/88
EFFINGHAM	ILL LOC/DME RWY 29	UNKNOWN	AWAITING ADO FEASIBILITY
KANKAKEE	ILL AWOS	UNKNOWN	IN FEASIBILITY
MT. VERNON	ILL AWOS	UNKNOWN	CONSTRUC APPROV 2/24/88
PERU	IND LOC/DME	UNKNOWN	CONSTRUC APPROV
FRANKFORT	IND NDB		FEASIBILITY 1/9/89
FRENCH LICK	IND LOC/NDB		LOC FAILS FLT CHK
GREENCARTLE	IND NDB		FEASIBILITY 4/18/89
INDIANAPOLIS METRO	IND NDB		FEASIBILITY 4/18/89
INDIANAPOLIS INTERNAT	IND ILS		PACKAGE SENT TO SPONSER
GOSHEN	IND GS/MM	1/18/89	TECH VERIFICATION
GREENWOOD	IND NDB		FEASIBILITY 1/9/89
JEFFERSONVILLE	IND ILS		FREQ REQUEST
BELL AIRE	MCH MLS		GRND CHK FY 89/2
PORT HURON	MCH ILS		PACKAGE ARRIV 2/28/89
STURGIS	MCH MLS		FEASIBILITY 1/9/89
WILLOW RUN	MCH		
AUSTIN	MIN VOR/DME		CONSTRUC APPROV 10/21/88
FLYING CLOUD	MIN GS/MM		FLT CHK 2/9/89

APPENDIX C

PROPOSED NON-FEDERAL ESTABLISHMENTS

AIRPORT	STATE	FACILITY	COMM. DATE	STATUS
MANKATO	MIN	GS/MM		PACKAGE TO SPONSER
STAPLES	MIN	NDB		FEASIBILITY 4/3/89
TWO HARBORS	MIN	NDB		FEASIBILITY 4/3/89
BATAVIA	OHI	NDB		TREE PROBLEM 4/18/89
DAYTON	OHI	ILS		REEVALUATION 4/5/89
BURKE LAKEFRONT	OHI	NDB		BATTLE CREEK EVAL
NEW KNOXVILLE	OHI	LOC/DME/NDB		AWAITING DRAWINGS
RICKENBACHER	OHI	ILS		CONSTRUC APPROV 11/10/88
OHIO STATE UNIVERSITY	OHI	AWOS		FEASIBILITY
OHAWA	OHI	NDB		AWAITING AIRSPACE
WILMINGTON	OHI	ATIS		APPROVAL 2/6/89
APPLETON	WIS	ILS/MALSR		AWAITING AIRSPACE 1/9/89
ASHLAND	WIS	DME		AWAITING GRND/FLT CHK
FONDULAC	WIS	LOC/GS/MM		FEASIBILITY 4/7/89
KENOSHA	WIS	AWOS		AWAITING SPONSER ACTION
KENOSHA	WIS	ILS		GRND/FLT CHK 1/23/89
PRAIRIE DU CHIEN	WIS	NDB		DOESN'T QUALIFY 2/7/89
SHEBOYGAN FALLS	WIS	LOC/GS/MM/OM/MALSR	3/9/89	FLT CHK OK
SPARTA	WIS	NDB		CONSTRUC APPROV 4/25/89
TOMAHAWK	WIS	NDB		RESPONSE TO SPONSER 2/87
WEST BEND	WIS	LOC	3/9/89	COMMISSION MESSG

APPENDIX D - AVIATION FORECAST

This appendix contains forecasts for the following:

a. Total aircraft operations at airports with Air Traffic Control Towers

b. Total Flight Services at Flight Service Stations

c. Total enplaned passengers at selected airports

d. Total aircraft operations at Air Route Traffic Control Centers

FY-89 data was obtained from facility records. All other data was obtained from the "Terminal Area Forecast;" "Air Route Traffic Control Center Forecast;" Total Flight Services, Pilot Briefs, Aircraft contracted, and Flight Plans originated; "FAA Statistical Handbook;" and "FAA Aviation Forecasts." These documents should be referred to for more detailed forecast data.

TOTAL AIRCRAFT OPERATIONS AT AIRPORTS WITH AIR TRAFFIC CONTROL TOWERS
(thousand)

	FY 1988	FY 2000
ILLINOIS		
Chicago O'Hare International	796	827
Chicago Pal-Waukee	249	303
Chicago DuPage	214	306
Champaign/Urbana	159	216
Chicago Midway	296	395
East St. Louis	154	180
Rockford	118	163
Aurora	135	254
Carbondale	104	162
Peoria	108	132
Alton	71	101
Springfield	124	152
Moline	89	119
Decatur	83	109
Chicago Meigs	62	88
Bloomington	78	91
INDIANA		
Indianapolis International	219	327
Fort Wayne	126	144
Lafayette	139	159
Terre Haute	84	167
South Bend	115	154
Evansville	92	120
Muncie	53	73
Bloomington	44	60
MICHIGAN		
Pontiac	380	438
Detroit Metro	380	514
Grand Rapids	143	191
Detroit Willow Run	176	215
Detroit City	133	187
Flint	114	164
Lansing	160	177
Traverse City	126	153
Ann Arbor	109	128
Kalamazoo	99	131
Jackson	69	92
Muskegon	56	72
MICHIGAN cont.		
Saginaw	52	78
Battle Creek	44	52
MINNESOTA		
Minneapolis-St. Paul International	380	525
Minneapolis-Flying Cloud	188	281
Minneapolis-Crystal	168	234
St. Paul	144	197
Rochester	62	91
Duluth	51	61
NORTH DAKOTA		
Bismarck	67	91
Fargo	80	99
Grand Forks	221	271
Minot	50	60
OHIO		
Cleveland-Hopkins	248	275
Port Columbus	234	305
Columbus Ohio State	142	177
Cincinnati Lunken	177	196
Akron-Canton	146	179
Dayton Cox	217	253
Youngstown	109	134
Cleveland Cuyahoga.....Contract	88	115
Toledo	111	141
Mansfield	60	66
Cleveland Burke	87	104
SOUTH DAKOTA		
Rapid City	67	86
Sioux Falls	90	118
WISCONSIN		
Milwaukee Mitchell	186	235
Madison	145	190
Janesville	78	100
Milwaukee Timmerman	105	116
Oshkosh	132	178
Green Bay	86	109
Appleton	70	94
LaCrosse	61	82

Source: Terminal Area Forecast, 1988-2000

AUTOMATED FLIGHT SERVICE STATIONS
TOTAL FLIGHT SERVICES (thousands)

Facility	FY-88	FY-99
Kankakee, IL	696	904
Terre Haute, IN	798	1,175
Lansing, MI	918	1,157
Princeton, MN	513	849
Grand Forks, ND	299	1,219
Cleveland, OH	540	781
Dayton, OH	937	1,056
Huron, SD	157	336
Green Bay, WI	620	901

NOTE: Total Flight Services, Pilot Briefs, Aircraft Contacted, and Plans Originated, AFA-APO-88-10, November 1988.

TOTAL AIRCRAFT OPERATIONS AT AIR ROUTE TRAFFIC CONTROL CENTERS (thousands)

	FY88	FY2000
Chicago Center	2,388	2,460
Cleveland Center	2,358	2,404
Indianapolis Center	1,945	2,041
Minneapolis Center	1,625	2,225

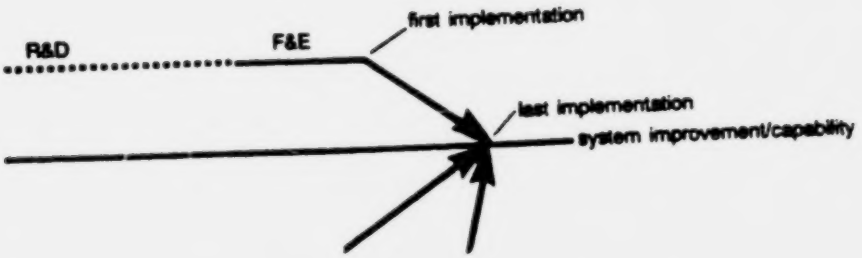
Source: FAA-APO-88-4, "Air Route Traffic Control Center Forecast" dated April, 1988.

TOTAL ENPLANED PASSENGERS AT SELECTED AIRPORTS (thousands)

	FY 1988	FY 2000
ILLINOIS		
Chicago O'Hare International	27,412	41,963
Champaign/Urbana	171	267
Chicago Midway	2,674	5,923
Peoria	242	424
Springfield	159	250
Moline	342	560
INDIANA		
Indianapolis International	2,493	3,743
Fort Wayne	318	433
South Bend	308	573
Evansville	261	433
MICHIGAN		
Detroit Metro	9,951	17,263
Grand Rapids	700	1,059
Flint	115	217
Lansing	188	322
Traverse City	63	134
Kalamazoo	207	259
Muskegon	36	57
Saginaw	225	298
MINNESOTA		
Minneapolis-St.Paul International	8,633	16,445
MINNESOTA cont.		
Rochester	129	176
Duluth	132	180
NORTH DAKOTA		
Bismarck	151	175
Fargo	236	262
Grand Forks	95	151
Minot	81	95
OHIO		
Cleveland-Hopkins	3,403	4,887
Port Columbus	1,853	7,253
Akron-Canton	373	426
Dayton Cox	2,330	3,755
Youngstown	60	75
Toledo	302	364
SOUTH DAKOTA		
Rapid City	189	239
Sioux Falls	280	349
WISCONSIN		
Milwaukee Mitchell	2,109	4,784
Madison	436	516
Green Bay	257	406
Appleton	153	191
LaCrosse	95	116

Source: Terminal Area Forecast, 1988-2000

Appendix E

LEGENDS
The following legends should be used for interpretation of evolution diagrams:

Evolution Diagrams: Evolution diagrams are provided to illustrate project relationships in Chapters I through II to illustrate project relationships toward the achievement of system improvements/capabilities.